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INTERNAL MEDICINE PRACTICE QUESTIONS

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Knowmedge is an interactive platform that was launched in April 2013. It features over 750 questions designed to help you understand and reinforce the key concepts covered on the exam. Each of our questions features a highly interactive audio visual explanation, in which our content experts walk you through the principles underlying each question to methodically arrive at the correct answer.

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We hope you find the questions in this book to be a valuable asset as you prepare for your upcoming exam. If you are interested in learning more about Knowmedge, please visit us at www.knowmedge.com.

If you have any questions about the contents of this eBook, send me a note at sunir@knowmedge.com

Best of luck in your preparations!

Sincerely,

Sunir

Sunir Kumar, MD
Co-founder, Chief Editor
Knowmedge

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Chapter

1

Cardiovascular Disease

Question #1

Topic: Cardiovascular Disease

Subtopic: Hypertension

40-year old male with no past medical history presents to the office complaining of fatigue he has been feeling for the past 8 months. He denies any shortness of breath or lightheadedness. He reports mainly that he feels very tired during the day time and feels like he needs to take a nap. He also noted recently that he nearly falls asleep when driving to work. He denies any vision changes or chest pain. On examination, his heart rate is 84/min, blood pressure is 156/60mmHg, and BMI is 33.7kg/m^2. Head and neck exam shows unremarkable fundoscopic exam and increased neck circumference. Cardiac examination shows regular rate and rhythm, normal S1 and S2, and no gallops or murmurs. Lung exam is clear to auscultation. Abdominal examination shows obese abdomen, but otherwise unremarkable. Extremities are without edema. Which of the following is the most appropriate next step?

A. Obtain an echocardiogram
B. Start hydrochlorothiazide
C. Perform nocturnal pulse oximetry
D. Start metoprolol
E. Obtain an electrocardiogram

Answer #1

Topic: Cardiovascular Disease

Subtopic: Hypertension

Correct Answer: C (Perform nocturnal pulse oximetry)

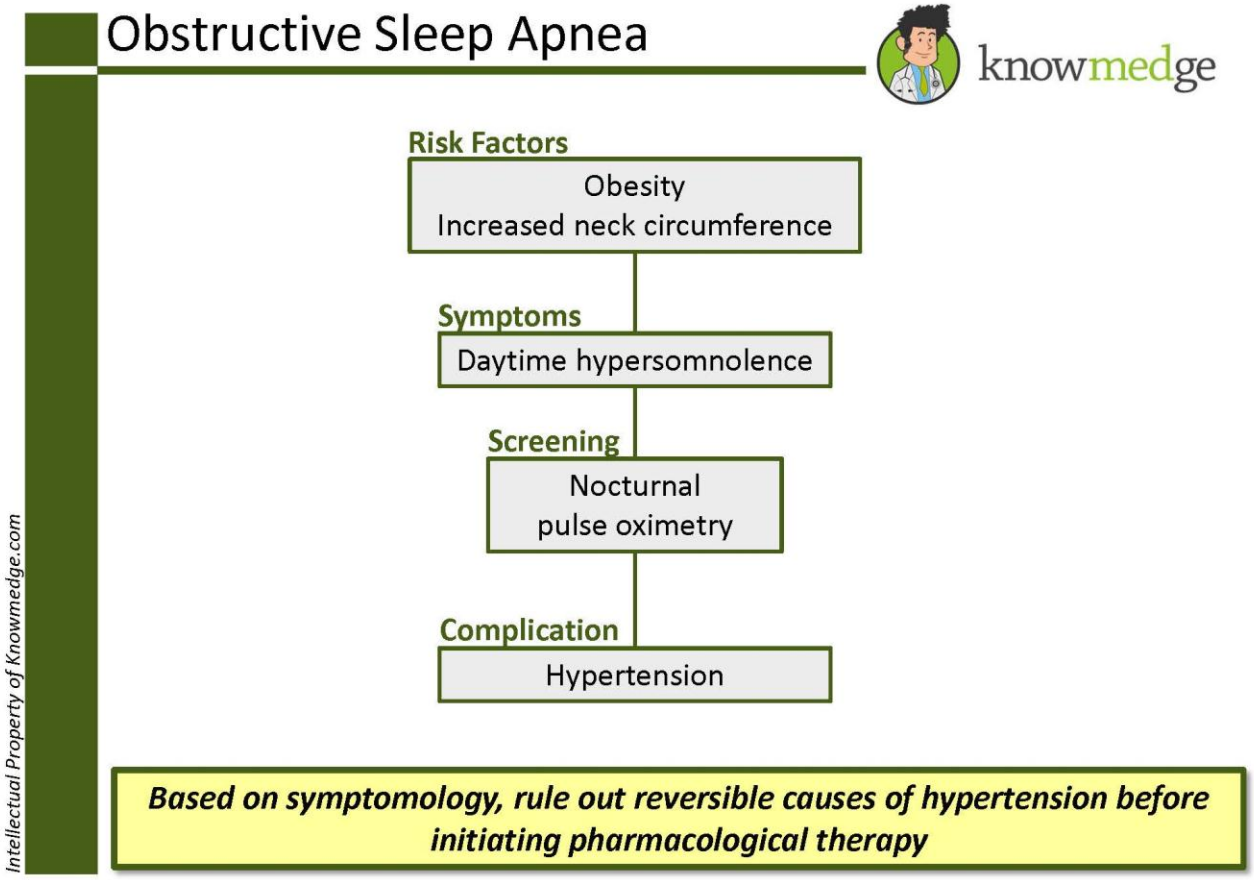
This patient has symptoms (daytime hypersomnolence) and risk factors (obesity, increased neck circumference) for obstructive sleep apnea. Sleep apnea is an important reversible cause of hypertension. Therefore it is important to evaluate and treat this patient for sleep apnea prior to initiating anti-hypertensive therapies. If treatment for sleep apnea does not result in lower the blood pressure, the next step would be to begin medications for blood pressure reduction.

Let's go over the answer choices:

- **Choice A** (Echocardiogram) is sometimes helpful in the management of hypertensive patients to assess for left ventricular hypertrophy, but would not be the next step for this patient.
- **Choice B** (Hydrochlorothiazide) is an appropriate first-line agent for essential hypertension, but it is more important to evaluate and treat this patient for a reversible etiology of his hypertension prior to starting therapy.
- **Choice C** (Nocturnal pulse oximetry) is the correct choice for screening this patient for obstructive sleep apnea.
- **Choice D** (Metoprolol) is no longer recommended as a first-line agent for essential hypertension unless there are certain comorbidities such as prior myocardial infarction or systolic congestive heart failure.
- **Choice E** (Electrocardiogram) would not be helpful in the initial management of this patient.

Topic: Cardiovascular Disease

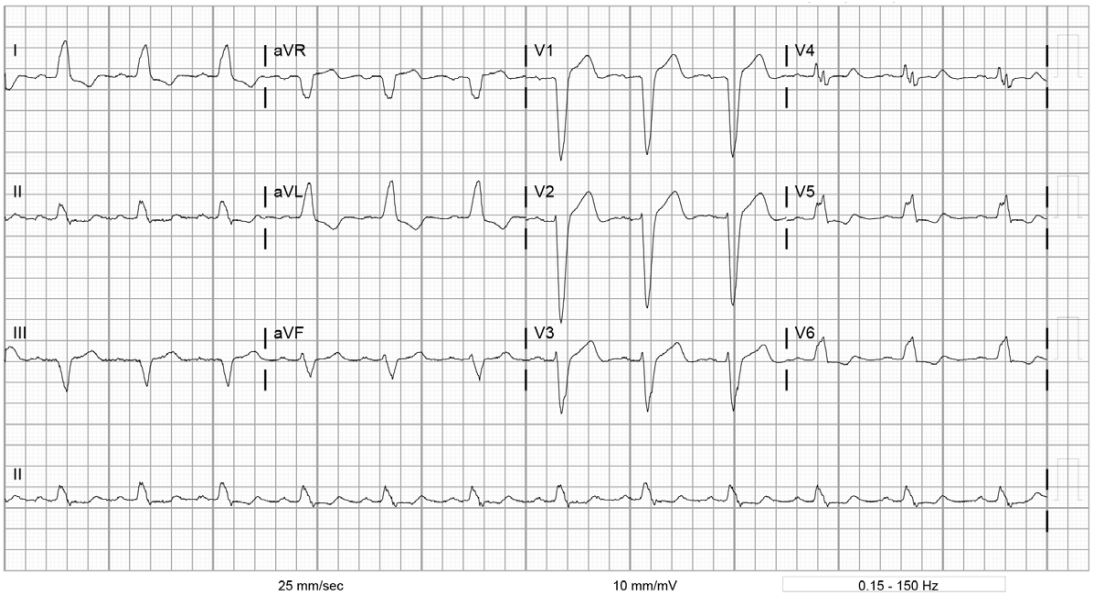
Subtopic: Hypertension



Question #2

Topic: Cardiovascular Disease

Subtopic: Ischemic Heart Disease



76-year-old male with hypertension, dyslipidemia, and osteoarthritis of the knees, is admitted for evaluation of chest pain. The chest pain is intermittent, occasionally occurring at rest and not worsened by exertion. He is pain free on arrival to the emergency room. The patient's home medications include aspirin 81mg daily and lisinopril 10mg daily. His vital signs show blood pressure 154/76mmHg and heart rate 76/min. Physical examination is unremarkable. His admitting electrocardiogram is shown above, and is unchanged from prior EKGs from one, three, and four years. He has had no further symptoms during the hospital stay. Which of the following is the most appropriate next step in management?

A. Exercise stress test without imaging
B. Exercise stress test with nuclear imaging
C. Pharmacologic stress test with nuclear imaging
D. Exercise stress with echocardiography
E. Cardiology consultation for catheterization

Answer #2

Topic: Cardiovascular Disease

Subtopic: Ischemic Heart Disease

Correct Answer: Choice B (Aspirin with colchicine)

This is a patient admitted with atypical chest pain who undergoes a "rule-out myocardial infarction" protocol. The next step to risk stratify this patient is a stress test. His baseline EKG shows a left-bundle branch block (LBBB) that is chronic (present on prior ECGs). In general, exercise stress testing of any sort should be avoided if the goal is to diagnose ischemia in a patient with a pre-existing LBBB.

Let's go over the answer choices:

- **Choice A** (Exercise stress test without imaging) is not correct. A patient must have an "interpretable" baseline EKG to be able to detect ischemia when the patient exercises. If a patient has a pre-existing LBBB, then the EKG cannot be used to detect ischemia that develops when a patient exercises. Thus, an EKG stress test is not sufficient in a patient with LBBB, and some form of imaging must be performed.

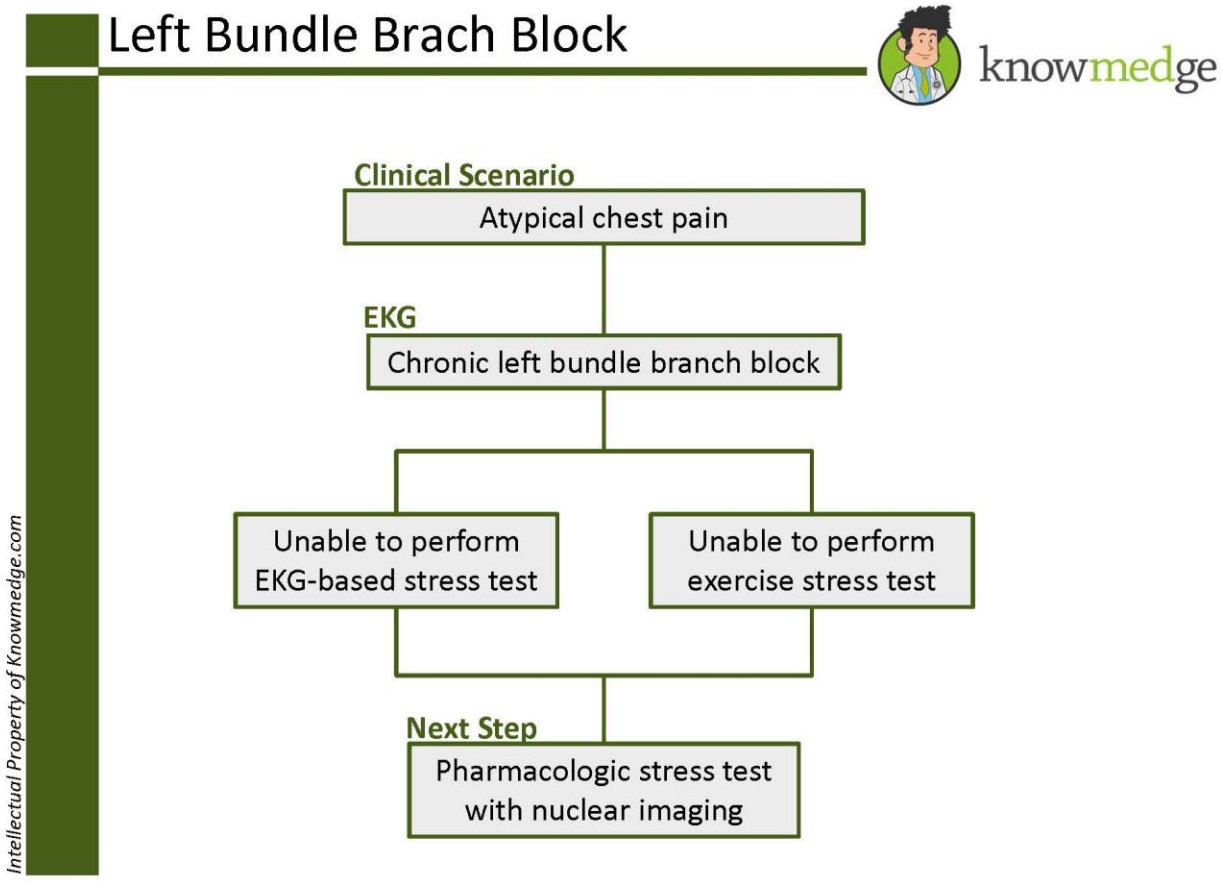
- **Choice B** (Exercise stress test with nuclear imaging) and **Choice D** (Exercise stress with echocardiography) are not correct. As stated in **Choice A**, in general, performing exercise stress test in patients with LBBB is not preferred. Exercising imaging tests in patients with LBBB can produce false-positive test results because the LBBB causes artifacts with both nuclear images and echocardiograms when done with exercise testing.

- **Choice C** (Pharmacologic stress test with nuclear imaging) is the correct answer. It is the only stress test among the answer choices that does not involve exercise. Pharmacologic stress tests are always done with imaging.

- **Choice E** (Cardiology consultation for catheterization) is not correct because this patient has atypical chest pain without any objective evidence of ischemia.

Topic: Cardiovascular Disease

Subtopic: Ischemic Heart Disease



Question #3

Topic: Cardiovascular Disease

Subtopic: Ischemic Heart Disease

76-year-old male with history of hypertension, hypercholesterolemia and tobacco use presents to the outpatient office complaining of substernal chest pressure, lightheadedness, mild associated dyspnea. He reports the sensation has been present for one month and occurs when he walks on level ground for 100 yards and is relieved after a few minutes of rest. The symptoms have been increasing in intensity and occurring with lower levels of exertion for the last 4 days. He denies any symptoms at rest. He denies any previous cardiac history. Physical examination shows blood pressure 100/64mmHg and heart rate 116/min. In general, he appears in no acute distress. Cardiac examination shows normal S1 and S2, a 2/6 systolic murmur at the right-upper sternal border, no gallops, and no rubs. Lungs are clear to auscultation. Extremities are warm without edema. 12-lead EKG shows sinus tachycardia with 1mm ST-segment in leads V4 through V6. Laboratory data show the following:

- Sodium 139mEq/L
- Potassium 3.9mEq/L
- Chloride 104mEq/L
- Bicarbonate 24meq/L
- BUN 18mg/dL
- Creatinine 0.7mg/dL
- Troponin-I 0.48ng/mL
- Creatine kinase 354U/I
- Creatine kinase-MB fraction 4%
- WBC 9,400/µL
- Hemoglobin 6.8 g/dL
- Platelets 168,000/µL

Which of the following is the most appropriate next step?

A. Emergent cardiac catheterization
B. Intravenous nitroglycerin, aspirin, and intravenous heparin
C. Pharmacologic stress test with nuclear imaging
D. Intravenous metoprolol
E. Stool guaiac testing

Answer #3

Topic: Cardiovascular Disease

Subtopic: Ischemic Heart Disease

Correct Answer: Choice E (Stool guaiac testing)

While this patient has symptoms consistent with unstable angina and cardiac enzymes and EKG indicate non-ST-elevation myocardial infarction, he has significant anemia. The tachycardia (heart rate greater than 100/min) and the "flow murmur" on examination are secondary to the anemia. Significant anemia can produce symptoms and signs of cardiac ischemia due to decreased oxygen delivery to the myocardial tissue. Moreover, before starting treatment for ischemia, which involves anticoagulants, it is important to be mindful of contraindications to these therapies. Active bleeding can be worsened with anticoagulants and can actually cause further harm to a patient such as this. The first step should be to evaluate sources of bleeding and also to correct the anemia with transfusions. The patient's symptoms and EKG may even improve after transfusion, once the oxygen carrying capacity of his blood has been improved to normal levels.

Let's go over the answer choices:

- **Choice A** (Emergent cardiac catheterization) is not correct. The first and most important step for this patient is to determine the cause of his anemia and administer blood transfusion. Catheterization and stenting, which also involves the use of anticoagulants, can be detrimental in a patient such as this. Once a stent is implanted, antiplatelet therapy with aspirin and clopidogrel must be maintained and if he develops worsening gastrointestinal bleeding, then there is a significant problem of stopping the antiplatelet regimen. Stopping antiplatelet therapy too soon after stent implantation can lead to stent thrombosis and myocardial infarction. Therefore, this patient should only be taken to catheterization once the bleeding has been identified and corrected and if he has persistent symptoms or signs of cardiac ischemia after the anemia is treated.

- **Choice B** (Intravenous nitroglycerin/heparin and aspirin) is not correct because it does not treat the underlying cause of his ischemia symptoms, which is the anemia. In fact, heparin and aspirin may worsen the anemia.

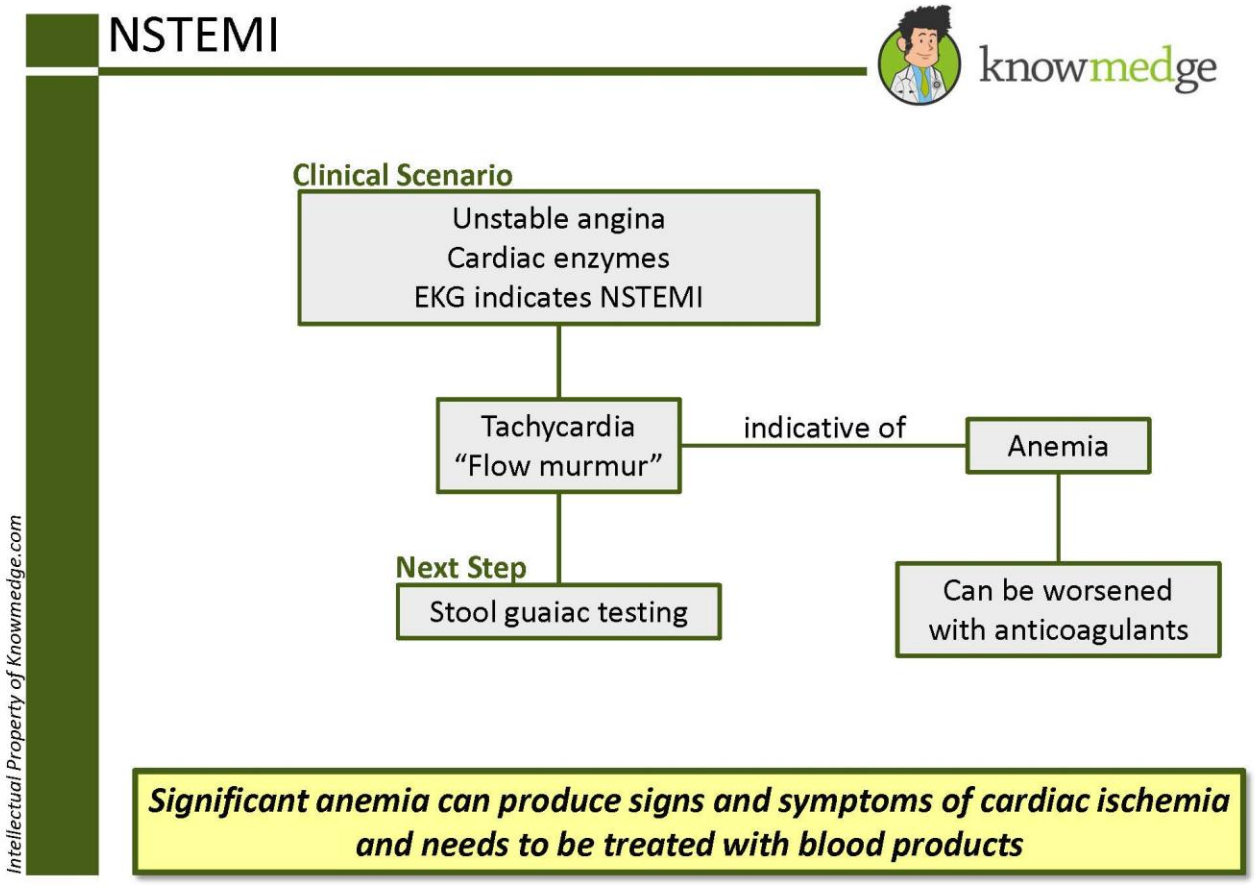
- **Choice C** (Pharmacologic stress test with nuclear imaging) is not correct. This patient needs evaluation and treatment of his anemia.

- **Choice D** (Intravenous metoprolol) is not correct. While this patient is tachycardic, the tachycardia is a compensatory response likely due to his anemia and possible blood loss.

- **Choice E** (Stool guaiac testing) is the correct answer. He should be evaluated and treated for the cause of his anemia. This test looks for hidden blood in a stool sample.

Topic: Cardiovascular Disease

Subtopic: Ischemic Heart Disease



Question #4

Topic: Cardiovascular Disease

Subtopic: Arrythmias

79-year-old female with hypertension presents to the emergency department complaining of fatigue and lightheadedness. She had recent viral gastroenteritis with nausea and vomiting that resolved two days ago. Her home medications include atenolol 75mg daily, hydrochlorothiazide 25mg daily, and lisinopril 10mg daily. In the emergency room, vitals show heart rate 34/min and blood pressure 80/62mmHg. Laboratory data are notable for serum creatinine of 2.5mg/dL and serum potassium of 4.2mEq/L. Previously, her serum creatinine was known to be normal. 12-lead ECG shows marked sinus bradycardia without any ST-segment changes. Which of the following medications is the most appropriate to administer next?

A. Intravenous calcium gluconate

B. Intravenous 50% dextrose solution and insulin

C. Intravenous glucagon

D. Intravenous magnesium sulfate

Answer #4

Topic: Cardiovascular Disease

Subtopic: Arrythmias

Correct Answer: Choice C (Intravenous glucagon)

This patient has an acutely reduced glomerular filtration rate due to recent gastrointestinal illness while taking diuretic and angiotensin converting enzyme inhibitor. Therefore, she has reduced clearance of atenolol, which is renally excreted. She has bradycardia (heart rate less than 60/min) and hypotension from beta-blocker toxicity. Thus, she needs beta-blocker reversal.

Let's go over the answer choices:

- **Choice A** (Intravenous calcium gluconate) is not correct. Intravenous calcium can be used in patients with toxicity from calcium-channel blocking agents. However, this patient needs to be treated for beta-blocker toxicity.

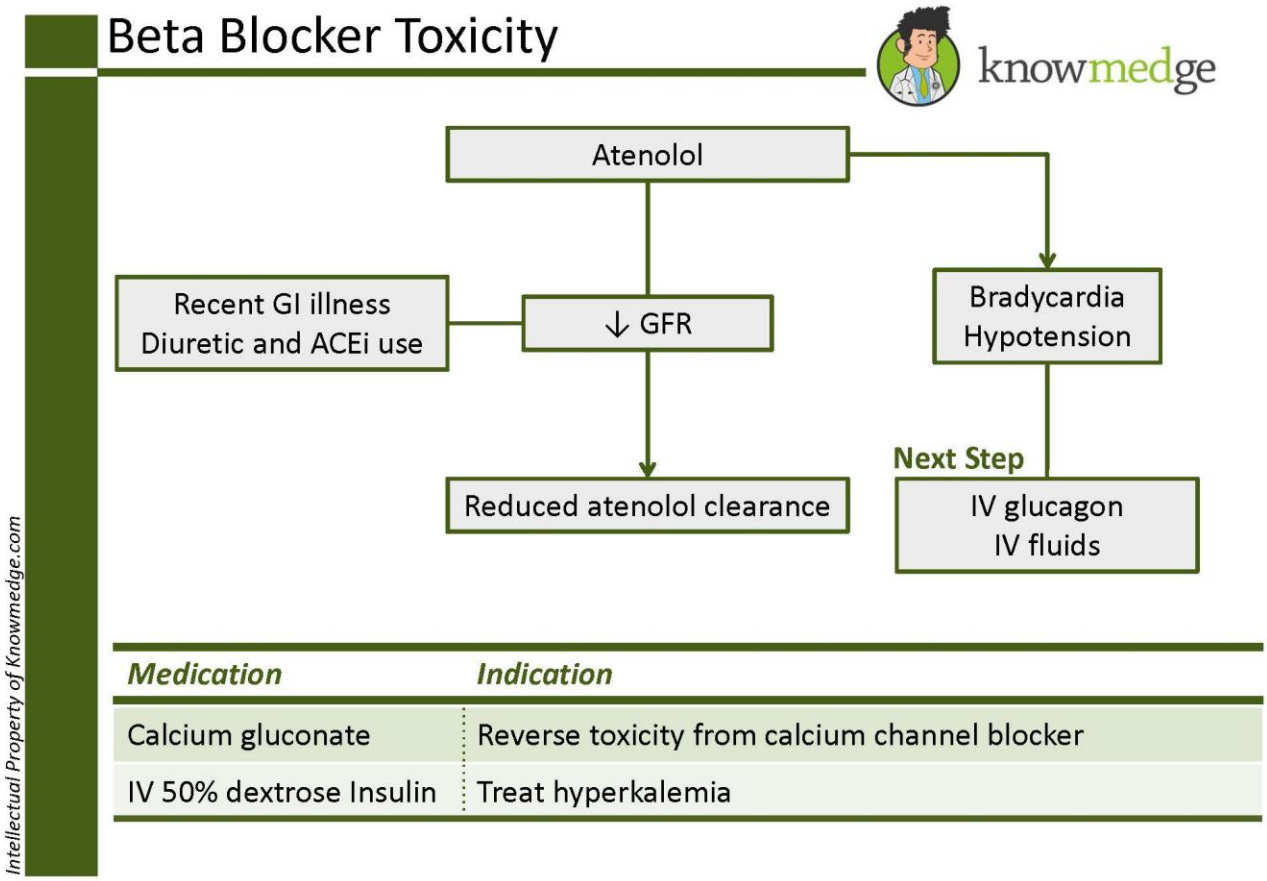
- **Choice B** (Intravenous 50% dextrose solution and insulin) is not correct. This is the treatment for patients with hyperkalemia. This patient does not have hyperkalemia.

- **Choice C** (Intravenous glucagon) is the correct answer. Glucagon is used in the treatment of beta-blocker toxicity. In patients who have excess beta-blockade, glucagon acts by activating the cyclic AMP secondary messenger system through glucagon receptors, essentially bypassing the blocked beta-adrenergic receptors. Thus, until the patient's body can clear the beta-blocker, she can be treated with intravenous glucagon. She should also receive supportive care with intravenous normal saline solution. If she does not improve with glucagon and IV fluids, externally pacemaker or transvenous pacemaker can also be used until the beta-blocker is cleared from the system.

- **Choice D** (Intravenous magnesium sulfate) is not correct. This is not used in the treatment of beta-blocker toxicity.

Topic: Cardiovascular Disease

Subtopic: Arrythmias



Medication	*Indication*
Calcium gluconate	Reverse toxicity from calcium channel blocker
IV 50% dextrose Insulin	Treat hyperkalemia

Question #5

Topic: Cardiovascular Disease

Subtopic: Congenital Heart Disease

41-year-old female presents to the clinic with increased dyspnea and fatigue. She has ignored these symptoms for a while but since they have progressively worsened, she decided it was time to come in for an evaluation. On physical examination, her lungs sound normal though you do notice some cyanosis and clubbing of her lower extremity when compared to her upper extremity. She undergoes an echocardiogram that reveals moderate pulmonary hypertension. Based on her clinical findings and diagnostic testing, which of the following is least likely to be true of her likely congenital heart defect?

A. Persistence of the condition after birth is associated with maternal rubella

B. Bi-ventricular hypertrophy may be associated with the pulmonary hypertension

C. This condition can present as a continuous machine-like murmur in the infraclavicular area

D. Under this condition, NSAIDs will close the patent ductus arteriosus (PDA) in full term babies, children or adults

E. This condition is associated with prematurity

Answer #5

Topic: Cardiovascular Disease

Subtopic: Congenital Heart Disease

Correct Answer: Choice D (Under this condition, NSAIDs will close the patent ductus arteriosus (PDA) in full term babies, children or adults)

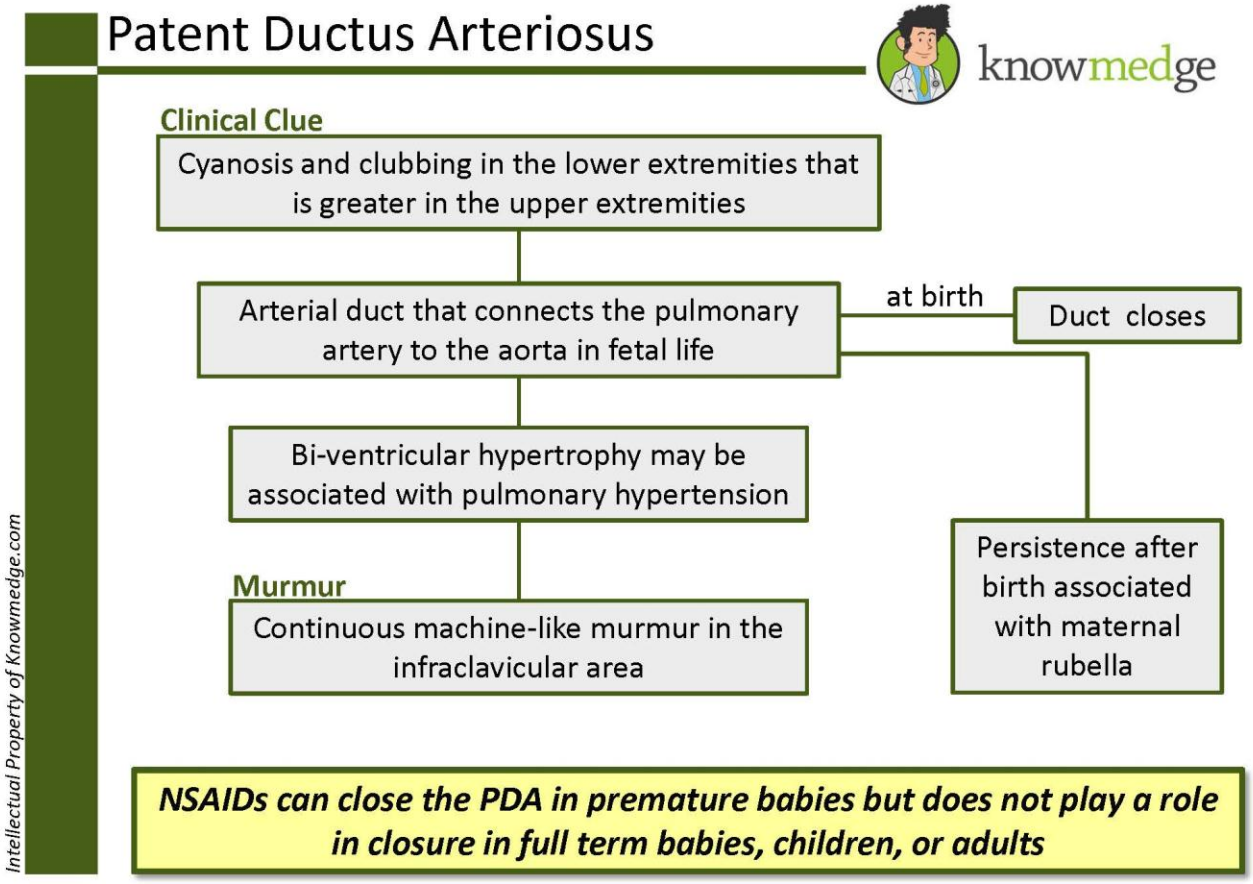
Cyanosis and clubbing in the lower extremities that is greater than the upper extremities provides the key clue that a patient has patent ductus arteriosus (PDA). The ductus arterioris is an arterial duct that connects the pulmonary artery to the aorta in fetal life. Generally within minutes or a few days after birth, the ductus arteriosus closes. In some newborns, this does not happen, resulting in a PDA. This congenital heart defect is more common in girls than boys. Though it can affect full-term babies, it is more often seen with premature babies. NSAIDs can close the PDA in premature babies. In other patients, treatment depends on the size and shape of the PDA. Transcatheter closure of small PDAs may be considered in those with history of previous infective endarteritis. For small PDAs in those without the history, observation is recommended. A moderate sized PDA with left heart enlargement without pulmonary artery hypertension may be treated with a percutaneous device closure.

Choice A (Persistence of the condition after birth is associated with maternal rubella), **Choice B** (Bi-ventricular hypertrophy may be associated with the pulmonary hypertension), **Choice C** (This condition can present as a continuous machine-like murmur in the infraclavicular area), and **Choice E** (This condition is associated with prematurity) are all true statements of PDA.

Only **Choice D** is false. NSAIDs can close the PDA in premature babies but do not play a role in closure in full term babies, children, or adults.

Topic: Cardiovascular Disease

Subtopic: Congenital Heart Disease



Question #6

Topic: Cardiovascular Disease

Subtopic: Cardiac Tumors

64-year-old female presents with slurred speech along with right arm and leg weakness. She has no prior cardiac history and no history of hypertension, diabetes, tobacco use, or dyslipidemia. She was previously very active and exercised regularly. Vital signs show heart rate 82/min, temperature 37°C, and blood pressure 126/62mmHg. Physical examination shows normal cardiac and pulmonary functions. Neurologic examination shows right upper and lower extremity hemiparesis and dysarthria. 12-lead EKG shows normal sinus rhythm without any other abnormality. Blood cultures are obtained and show no growth after several days and the patient has not had any antibiotics recently. White blood cell count is within normal limits. MRI of the brain confirms embolic stroke. Transthoracic echocardiogram is performed and shows an echodensity on the aortic valve. Transesophageal echocardiogram shows a round mobile echodensity attached to the aortic valve that is 1.5cm in dimension and is attached to the valve leaflet with a stalk. Which of the following is the most appropriate next step?

A. Start aspirin daily
B. Start aspirin and dipyridamole two times per day
C. Start warfarin anticoagulation
D. Obtain surgical consultation
E. Start intravenous antibiotics

Answer #6

Topic: Cardiovascular Disease

Subtopic: Cardiac Tumors

Correct Answer: Choice D (Obtain surgical consultation)

This patient developed an embolic stroke from a cardiac tumor called papillary fibroelastoma. This is the third most common cardiac tumor, after myxoma and lipoma. Papillary fibroelastoma is a benign tumor that often appears round or oval in shape on echocardiogram, is often mobile. It is usually attached to one of the valves, most commonly the aortic valve. Most patients with papillary fibroelastoma are asymptomatic and the tumor is an incidental finding that can simply be observed and monitored. However, in patients who develop symptoms of embolization, the tumor must be excised. Embolic phenomena from this tumor cannot be treated with antiplatelet therapy or anticoagulation.

Let's go over the answer choices:

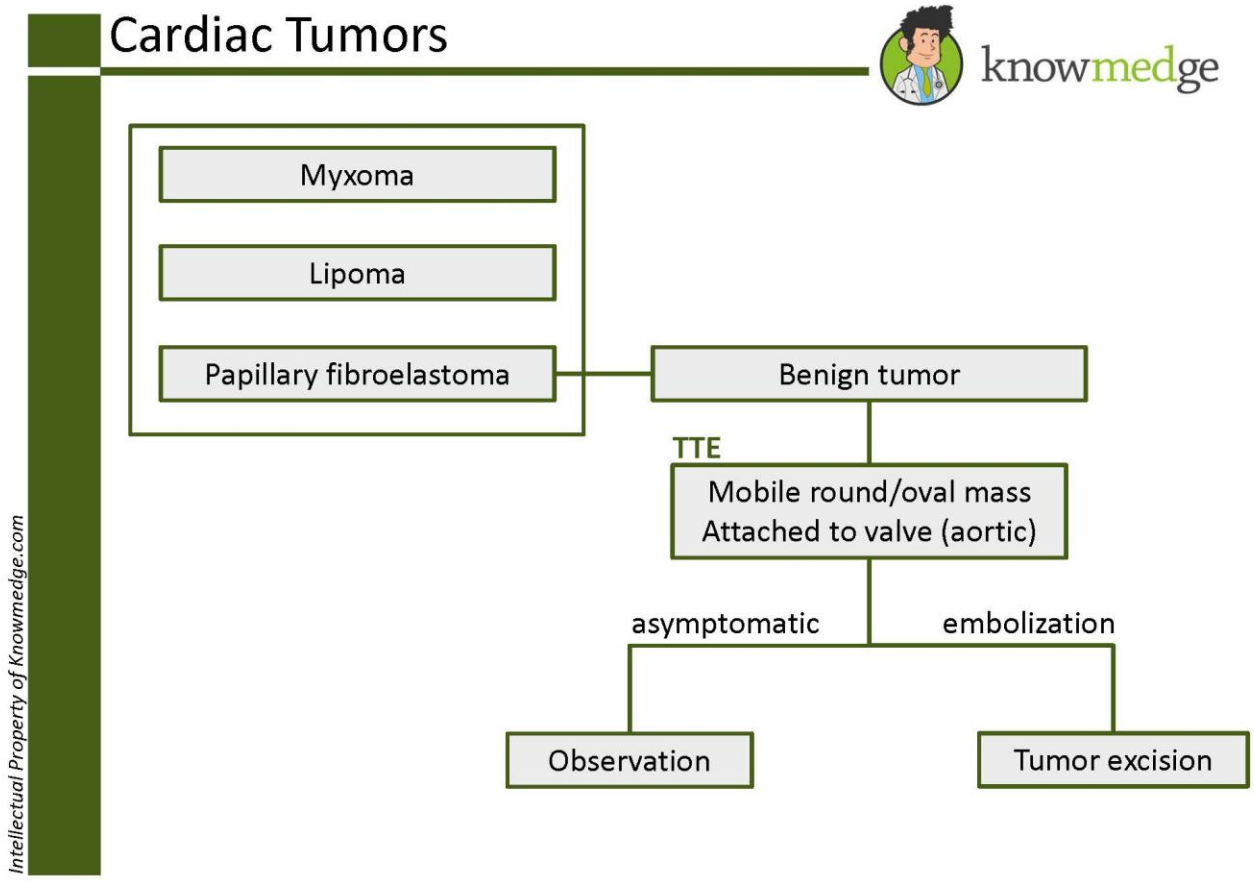
- **Choice A** (Start aspirin daily), **Choice B** (Start aspirin and dipyridamole two times per day), and **Choice C** (Start warfarin anticoagulation) are not correct. Starting antiplatelet or anticoagulant therapy for this patient's stroke is not sufficient to reduce her risk for recurrent stroke or other embolic events.

- **Choice D** (Obtain surgical consultation) is the correct answer. Surgical excision is the recommended treatment for patients with papillary fibroelastoma and embolic events.

- **Choice E** (Start intravenous antibiotics) is not correct. While vegetations from infectious endocarditis can often appear very similar to papillary fibroelastoma on echocardiography, this patient does not have any other clinical findings that would correlate with endocarditis. She is afebrile, has negative blood cultures and normal white blood cell count, does not have any murmurs or significant valvular regurgitation, and does not exhibit any peripheral stigmata of endocarditis. Thus, treatment with antibiotics is not warranted. Even if endocarditis was a consideration, a patient with a large enough tumor and embolic phenomenon should also receive a surgical consultation.

Topic: Cardiovascular Disease

Subtopic: Cardiac Tumors



Chapter

2

Endocrinology & Metabolism

Question #7

Topic: Endocrinology & Metabolism

Subtopic: Adrenal disorders

40-year-old female presents for an annual checkup. She has always had problems getting her blood pressure under control. She has had no other medical problems. She has been put on several regimens and is currently on hydrochlorothiazide, nifedipine, and clonidine. The patient's blood pressure is still elevated today at 165/110mmHg. You are now concerned about secondary causes of hypertension.

Her aldosterone:renin ratio is normal. 24-hour urine cortisol is normal. 24-hour urine metanephrine and catecholamine levels are high. You order a CT scan of the adrenals that confirms that the patient has a mass. Which of the following is the most appropriate next step in management?

A. Observe at this time

B. Surgery

C. Phenoxybenzamine, then beta blocker, and then surgery

D. Beta blocker, then phenoxybenzamine, and then surgery

E. Phenoxybenzamine and beta blocker concurrently, then surgery

Answer #7

Topic: Endocrinology & Metabolism

Subtopic: Adrenal Disorders

Correct Answer: Choice C (Phenoxybenzamine, then beta blocker, and then surgery)

Based on the elevated blood pressure and the elevated 24-hour urine metanephrine levels, this patient likely has a pheochromocytoma. This condition generally occurs as a result of chromaffin cells in the adrenal medulla that release excess catecholamines. Signs and symptoms of pheochromocytoma include:

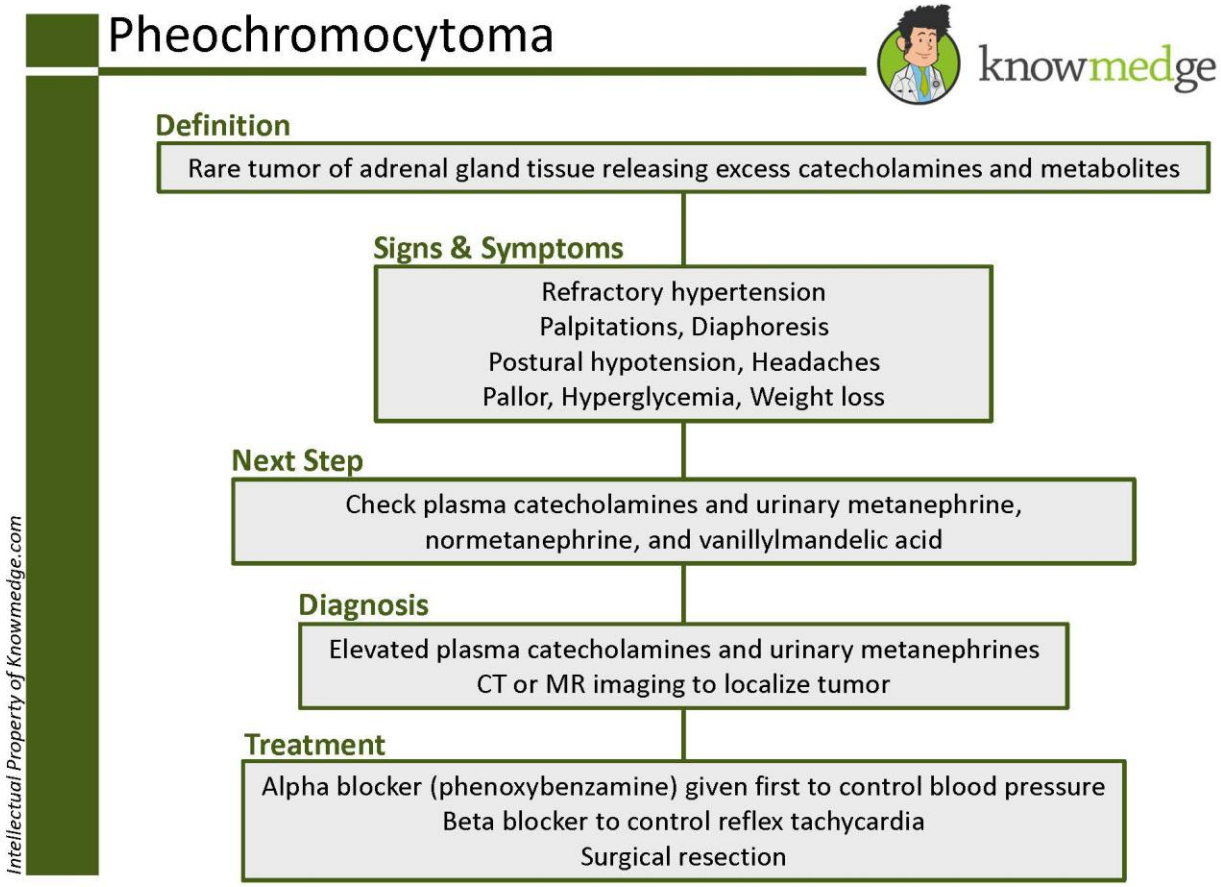
- Refractory hypertension despite being on several medications
- Palpitations
- Diaphoresis
- Postural hypotension
- Headaches
- Pallor
- Hyperglycemia
- Weight loss

The next step is to check plasma catecholamines and their urinary by-products. The diagnosis is made with elevated plasma catecholamines and urinary metanephrines along with MT or MR imaging localizing the tumor. Before surgical removal of the tumor, blood pressure needs to be controlled which helps decrease perioperative mortality.

Beta blockers are not given first as they would lead to unopposed alpha stimulation that will increase blood pressure. An alpha blocker - preferably a long-acting, noncompetitive one such as phenoxybenzamine or phentolamine - is given initially and then beta blockers are added for preventing reflex tachycardia. Only **Choice C** (Phenoxybenzamine, then beta blocker and then surgery) describes the proper steps to treat pheochromocytoma.

Topic: Endocrinology & Metabolism

Subtopic: Adrenal disorders



Question #8

Topic: Endocrinology & Metabolism

Subtopic: Thyroid Disorders

67-year-old female presents to your clinic because of weakness, cold intolerance, and lack of bowel movements. She says she has been feeling depressed lately. She denies weight gain. Physical exam is significant for blood pressure of 90/60mmHg. She is a thin individual and has hyperpigmentation of her skin. She denies suicide thoughts. You order lab work on the patient and it shows the following:

- Sodium 138mEq/L
- Potassium 5.2mEq/L
- Chloride 108mEq/L
- Bicarbonate 20mEq/L
- BUN 10mg/dL
- Creatinine 1.0mg/dL
- Glucose 58mg/dL
- TSH 20μU/mL
- Free T4: 0.1ng/dL

Which of the following is the best next step in management?

A. Start her on thyroid replacement therapy

B. Refer her to a psychiatrist for her depression

C. Start dexamethasone, then oral levothyroxine, and perform a cosyntropin stimulation test

D. Start hydrocortisone, then oral levothyroxine, and perform a cosyntropin stimulation test

E. Check cosyntropin stimulation test and start levothyroxine

Answer #8

Topic: Endocrinology & Metabolism

Subtopic: Thyroid Disorders

Correct Answer: Choice C (Start dexamethasone, then oral levothyroxine, and perform a cosyntropin stimulation test)

Based on the patient's symptoms and lab results, she likely has Schmidt's syndrome, which is also known as autoimmune polyendocrine syndrome type 2. Schmidt's syndrome is characterized as hypothyroidism along with adrenal insufficiency and/or type I diabetes mellitus. The patient's hypothyroidism is indicated by labs showing an elevated TSH and decreased free T4. Clues that she also has adrenal insufficiency are the following:

- Thin body habitus
- Hyperkalemia
- Hypoglycemia
- Metabolic acidosis
- Hyperpigmentation

Adrenal insufficiency is a potentially life-threatening condition that must be dealt with immediately. The best action to take before starting thyroid replacement therapy in individuals we are concerned are experiencing Schmidt's syndrome is to start dexamethasone. Dexamethasone is an analog of cortisol that will likely help correct the adrenal insufficiency. Dexamethasone will not interfere with the cosyntropin stimulation test. After starting dexamethasone, we would want to start the patient on oral levothyroxine. Levothyroxine will help correct the patient's hypothyroidism. Then we would perform a cosyntropin stimulation test to confirm the patient has adrenal insufficiency.

If the test indicates that the patient does have adrenal insufficiency, then it would be appropriate to start hydrocortisone. This makes **Choice C** (Start dexamethasone, then oral levothyroxine, and then perform a cosyntropin stimulation test) the correct answer.

Let's go over the other answer choices:

- **Choice A** (Thyroid replacement therapy) is incorrect as she likely has Schmidt's syndrome so she will require steroids before thyroid replacement therapy.

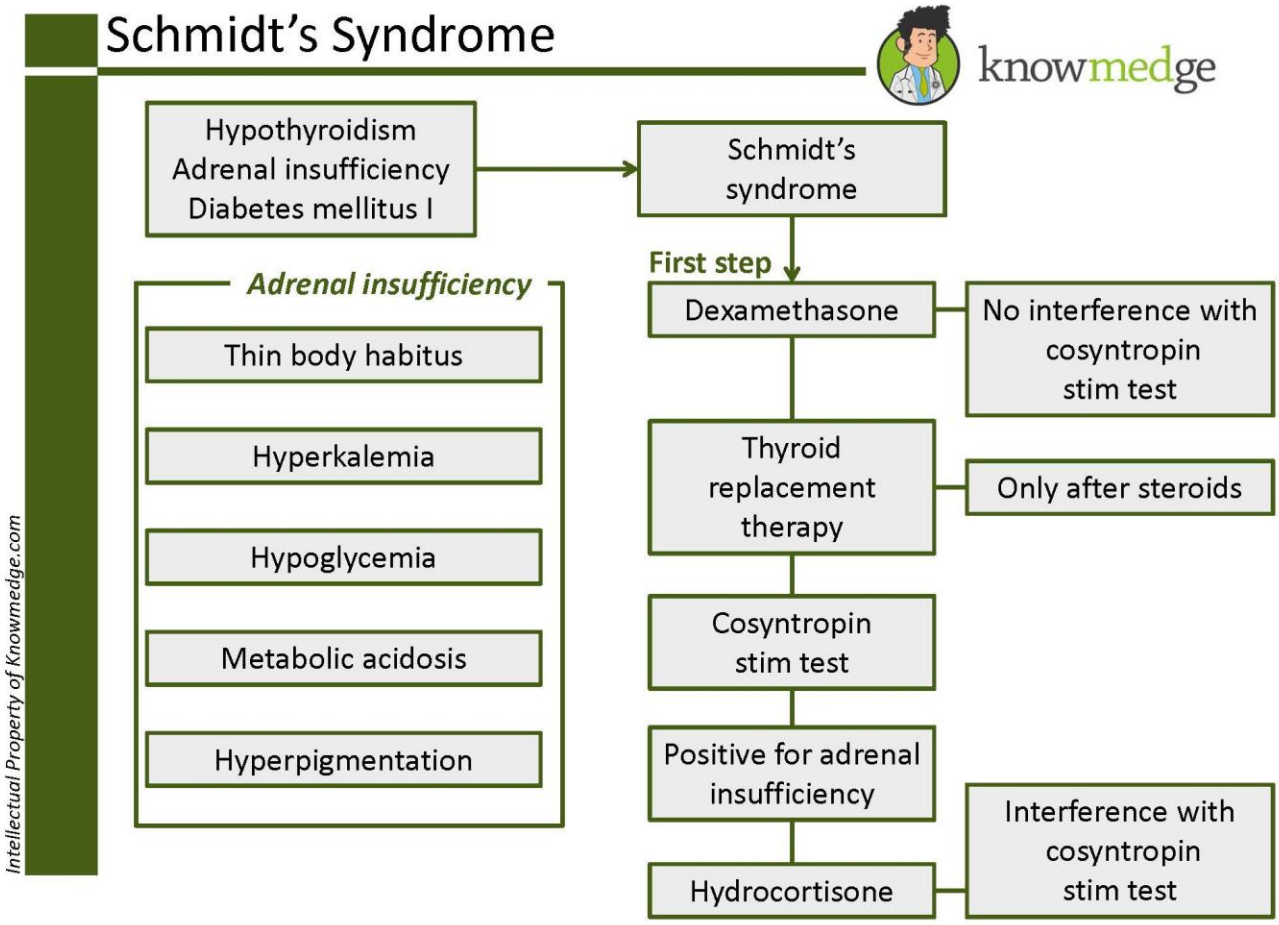
- **Choice B** (Psychiatry referral for depression) is incorrect as the likely reason for depression is hypothyroidism. Once the low thyroid state is corrected, her depression should improve as well.

- **Choice D** (Hydrocortisone, then oral levothyroxine, and then do cosyntropin stimulation test) is incorrect because giving hydrocortisone first will cause interference with the cosyntropin stimulation test results.

- **Choice E** (Check cosyntropin stimulation test and start levothyroxine) is incorrect because you want to give steroids immediately if adrenal insufficiency is suspected as this condition can be life threatening.

Topic: Endocrinology & Metabolism

Subtopic: Thyroid Disorders



Question #9

Topic: Endocrinology & Metabolism
Subtopic: Diabetes Mellitus

35-year-old male presents to your office for a work-related physical. He says he is in good health and voices no complaints at this time. He has no past medical history or surgical history present. Family history is positive for diabetes on his mother's side. He denies smoking, drinks alcohol socially, and denies illegal drugs.

His vital signs include blood pressure of 124/80mmHg, pulse 75/min, temperature 36.8°C, respiratory rate 20/min. Body mass index is 32.0kg/m^2. Physical exam is otherwise unremarkable. He gets lab work done and comes back a week later to discuss the results. His LDL is 101mg/dL, HDL 42mg/dL, total cholesterol and triglycerides normal. Complete blood count (CBC), renal function and liver function tests are also normal. His blood glucose on the labs comes back at 108mg/dL. He says he is fasting today. You obtain finger stick glucose in the office today that shows a glucose level of 110mg/dL.

Which of the following is the next best step for this patient?

A. Start metformin
B. Start glipizide
C. Start rosiglitazone
D. Start basal insulin
E. Encourage lifestyle modifications

Answer #9

Topic: Endocrinology & Metabolism

Subtopic: Diabetes Mellitus

Correct Answer: Choice E (Encourage lifestyle modifications)

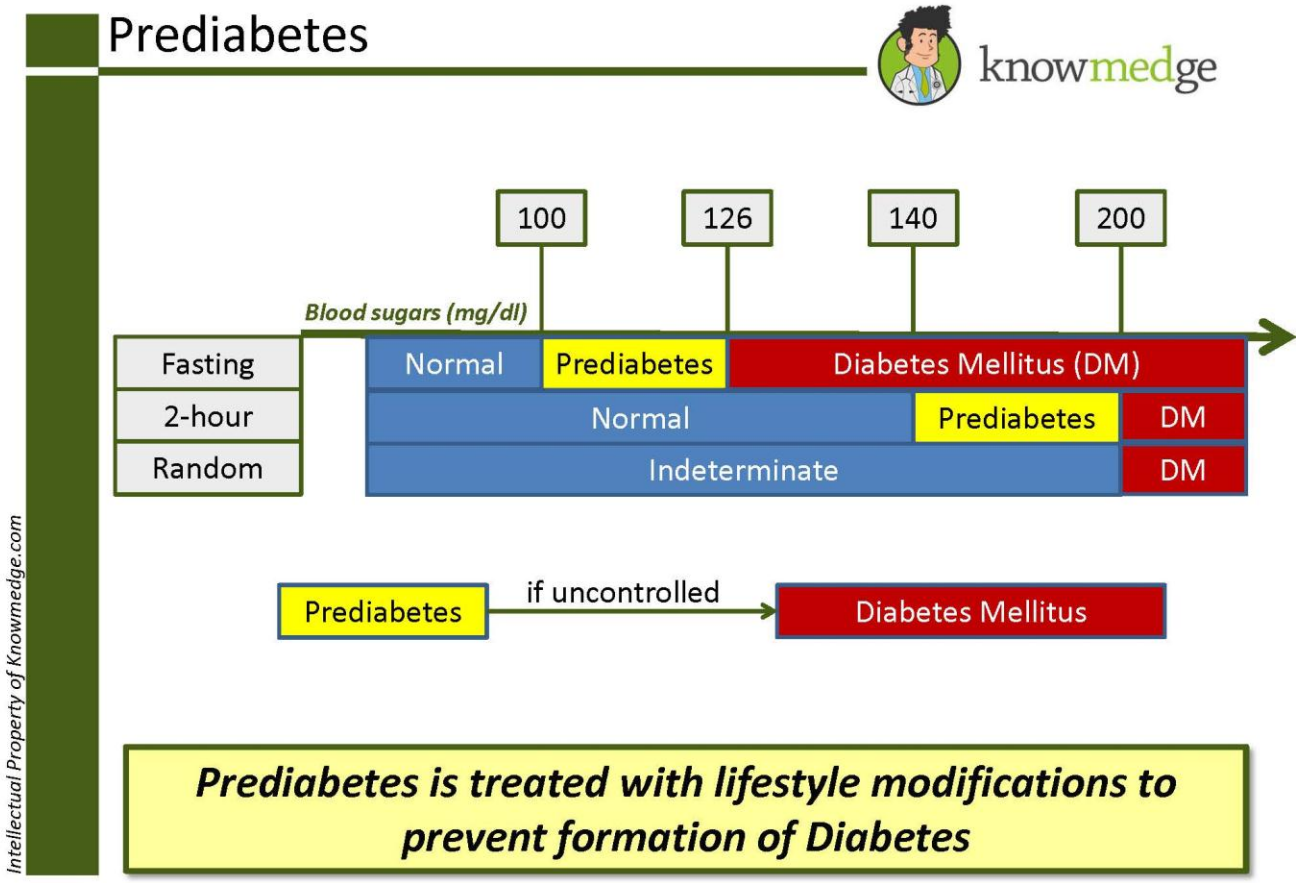
Prediabetes is defined as two or more fasting blood sugar values of 100-125mg/dL or a blood sugar of 140-199mg/dL two hours after a 75g glucose load. Diabetes can be diagnosed in patients who have:

- Two fasting blood glucose greater than or equal to 126mg/dL OR
- Blood sugar greater than or equal to 200mg/dL 2 hours after a 75g load of oral glucose OR
- A random blood glucose greater than or equal to 200mg/dL in the context of polyuria, polydipsia, or unintentional weight loss

This patient has prediabetes at this time since both his fasting sugars have been between 100-125mg/dL. The best recommendation to convey to this patient is diet and exercise as he has a high body mass index, making **Choice E** (Encourage lifestyle modifications) the best answer. Additionally, he should be told that if he doesn't control his prediabetes now, this can lead to diabetes mellitus and will likely require medical treatment in the future.

Topic: Endocrinology & Metabolism

Subtopic: Diabetes Mellitus



Question #10

Topic: Endocrinology & Metabolism

Subtopic: Lipid Disorders

All of the following scenarios require an LDL goal of 100mg/dL, ideally less than 70mg/dL except:

A. 45-year-old female found to have random sugar of 250mg/dL

B. 55-year-old male found to have Non-ST-Segment Myocardial Infarction (NSTEMI) and undergoes cardiac stenting

C. 68-year-old male smoker found to have 2.5cm abdominal aortic aneurysm on an ultrasound

D. 51-year-old female with dizziness found to have severe carotid artery stenosis

E. 39-year-old obese male with hypertension on lisinopril

Answer #10

Topic: Endocrinology & Metabolism

Subtopic: Lipid Disorders

Correct Answer: Choice E (39-year-old obese male with hypertension on lisinopril)

Patients are given a goal LDL based on their Framingham risk score (test that deterimens a patient's likelihood of having a heart attack within 10 years). Some risk factors include age, smoking history, and family history of heart disease and hypertension. For more in-depth information about the Framingham scoring system, please visit: *http://hp2010.nhlbihin.net/atpiii/calculator.asp*

Individuals who have zero or only one risk factor for coronary heart disease require a goal LDL less than 160mg/dL. With 2 or more risk factors, you have to calculate a more specific Framingham risk to determine their goal LDL.

Patients who have coronary artery disease (CAD) or CAD equivalents require LDL less than 100mg/dL with an ideal goal of less than 70mg/dL. CAD equivalents include:

- Diabetes mellitus
- Carotid artery disease
- Aortic aneurysm
- Peripheral vascular disease

Now let's go through the answer choices:

- **Choice A** is a diabetes mellitus patient; therefore, the goal LDL should be less than 100mg/dL, preferably less than 70mg/dL, as it is for all patients with CAD equivalents.

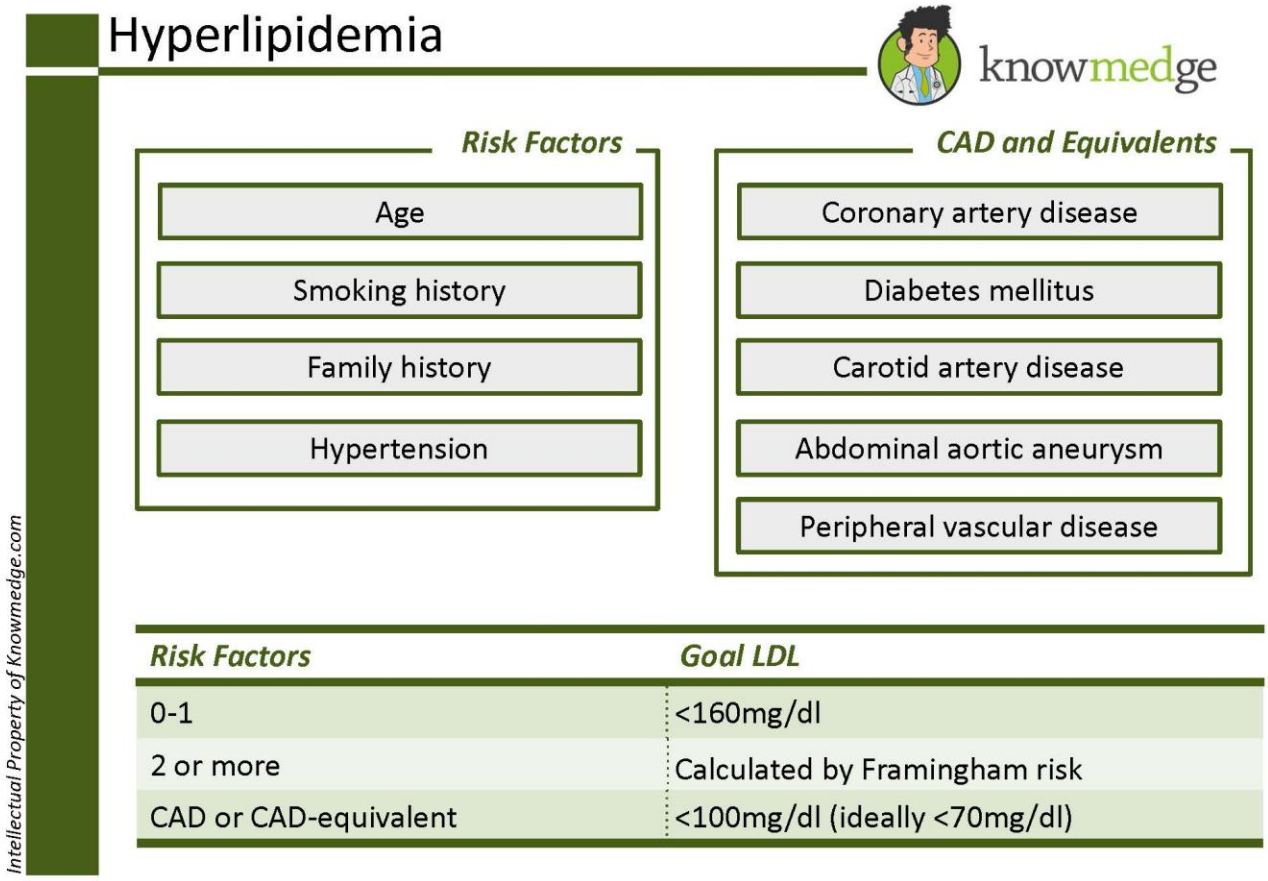
- **Choice B** (CAD) carries the same recommendations.

- **Choice C** (2.5cm abdominal aortic aneurysm) and Choice D (Severe carotid artery stenosis) are CAD equivalents.

- **Choice E** (Hypertension in an obese patient) does not necessarily require a goal LDL of less than 100mg/dL. In this patient, we would have to calculate a Framingham risk score to determine his specific goal LDL.

Topic: Endocrinology & Metabolism

Subtopic: Lipid Disorders



Risk Factors	Goal LDL
0-1	<160mg/dl
2 or more	Calculated by Framingham risk
CAD or CAD-equivalent	<100mg/dl (ideally <70mg/dl)

Question #11

Topic: Endocrinology & Metabolism

Subtopic: Calcium and Bone

Which of the following scenarios is the least likely to be a risk factor for osteoporosis?

A. 35-year-old male has been on phenytoin for several years to control his seizures

B. 62-year-old male takes finasteride for benign prostate hyperplasia

C. 29-year-old female with hypothyroidism takes thyroid replacement therapy, which has made her euthyroid

D. 51-year-old male with long standing history of severe COPD takes albuterol, ipratropium, and prednisone

E. 21-year-old female's labs show her anti-tissue transglutaminase is positive

Answer #11

Topic: Cardiovascular Disease

Subtopic: Calcium and Bone

Correct Answer: Choice C (29-year-old female with hypothyroidism takes thyroid replacement therapy, which has made her euthyroid)

Risk factors for osteoporosis can be broken down into: age, medical conditions, medications and lifestyle

- Age: Advanced age and post-menopause are risk factors for osteoporosis.
- Medical conditions: Conditions that increase the risk of developing osteoporosis include 1) Hyperthyroidism 2) Hyperparathyroidism 3) Multiple myeloma 4) Decreased vitamin D levels 5) Decreased calcium levels
- Medications: Medications that increase the risk of developing osteoporosis include 1) Dilantin 2) Long term steroids 3) Long term heparin 4) Aromatase inhibitors 5) LHRH agonists.
- Lifestyle: Conditions that increase the risk of developing osteoporosis include 1) Sedentary lifestyle (biggest risk factor) 2) Low BMI 3) Excessive alcohol use.

Of the above answer choices, only **Choice C** (29-year-old female with hypothyroidism takes thyroid replacement therapy, which has made her euthyroid) does not pose a greater risk for osteoporosis.

Hyperthyroidism is a risk factor for osteoporosis but remaining euthyroid is not a risk factor. Let's go through the other answer choices and see why each is a risk factor:

- **Choice A** (Long-term phenytoin use) is a risk factor because it, like other anti-epileptic agents, can induce hepatic CYP-450 enzymes, causing rapid metabolism of vitamin D and estrogen. In addition, it can decrease the amount of fractional calcium absorption.

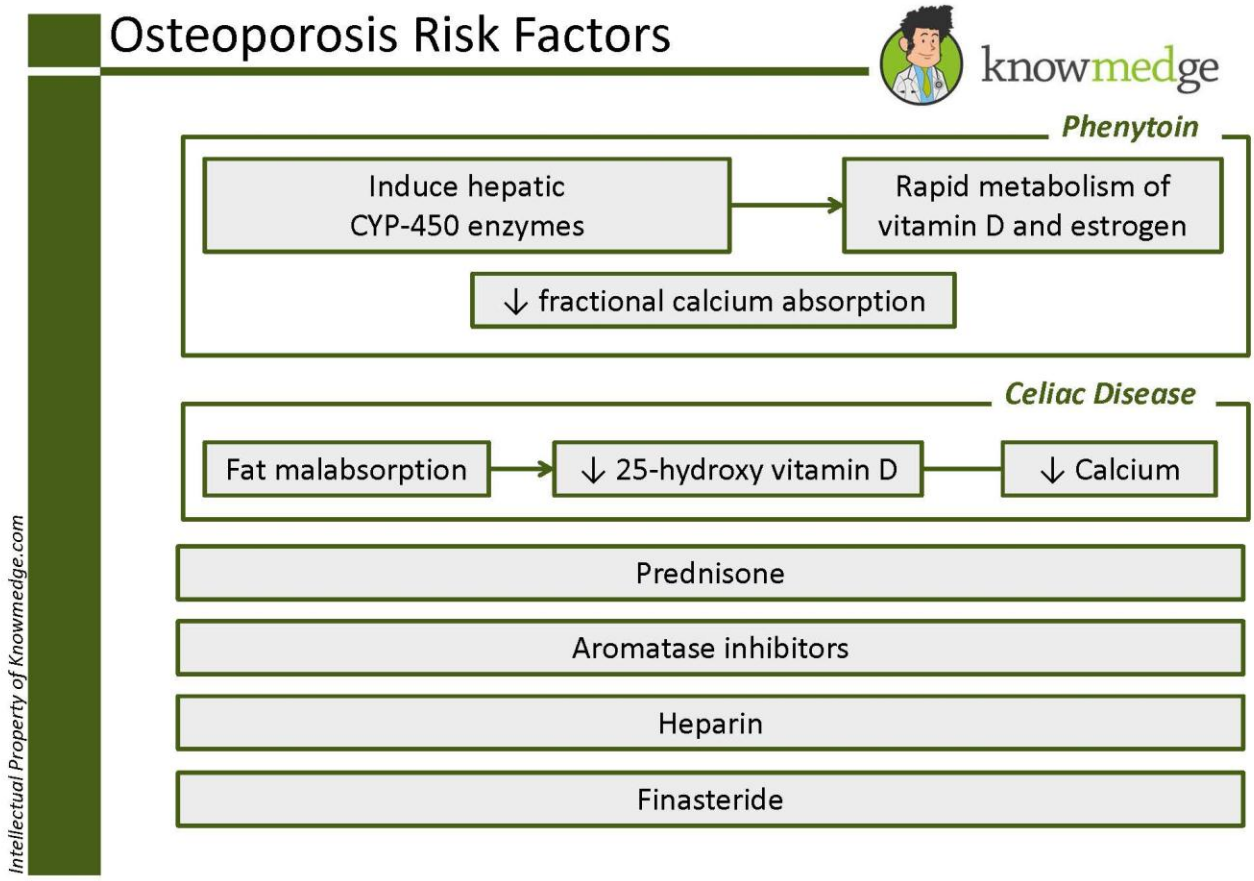
- **Choice B** (Finasteride) and **Choice D** (Chronic prednisone) patients are also at an increased risk for developing osteoporosis.

- **Choice E** (Anti-tissue transglutaminase positive) is a little challenging but this patient also is at increased risk of osteoporosis. This antibody is positive in many patients with celiac disease, which is a disease in which malabsorption of fat-soluble vitamins like vitamin D can occur. As a result, vitamin D

25 OH levels are low. These low levels will cause decreased calcium and, therefore, increase the risk of developing osteoporosis.

Topic: Endocrinology & Metabolism

Subtopic: Calcium and Bone



Chapter

3

Gastroenterology

Question #12

Topic: Gastroenterology
Subtopic: Esophageal Diseases

57-year-old female with a 30-year history of smoking presents with difficulty swallowing solid food such as steak. This has been going on for about five months and now has progressed to where she is having some difficulty swallowing liquids. She has some decreased appetite and has lost about 12 lbs in three months. The patient denies any reflux symptoms, nausea, vomiting or abdominal pain. Which of the following conditions is the most likely cause of this patient's dysphagia?

A. Peptic stricture
B. Adenocarcinoma of the esophagus
C. Squamous cell carcinoma of the esophagus
D. Achalasia
E. Diffuse esophageal spasm

Answer #12

Topic: Gastroenterology

Subtopic: Esophageal Diseases

Correct Answer: Choice C (Squamous cell carcinoma of the esophagus)

Dysphagia problems can be broken down into nasopharyngeal, mechanical obstruction and motility problems.

- **Nasopharyngeal dysphagia** is a problem where the food bolus can't transfer from the oropharynx to the esophagus. These problems are usually a result of neuromuscular disorders such as Parkinson's disease, stroke, myasthenia gravis, or mechanical abnormalities like thyroid enlargement or cervical osteophytes.
- **Mechanical obstruction** causes of dysphagia are to solids and can progress to liquids later. These include Schatzki rings, peptic strictures and esophageal cancer.
- **Motility dysphagia** is for solids AND liquids concurrently and include diffuse esophageal spasm, systemic sclerosis or achalasia.

In this example, our patient has problems swallowing solids first and then progresses to liquids which makes mechanical obstruction more likely. With weight loss, decreased appetite, and progressive dysphagia from solids to now also liquids, this patient likely has an underlying malignancy.

Adenocarcinoma of the esophagus can occur from Barrett's esophagus as a result of uncontrolled GERD. This patient does not give a history of having reflux problems so the patient likely does not have adenocarcinoma of esophagus.

Choice C (Squamous cell carcinoma of the esophagus) is associated with cigarette smoking. This patient does have a long standing smoking history so will likely have squamous cell carcinoma of esophagus when EGD and biopsy results are obtained.

Topic: Gastroenterology

Subtopic: Esophageal Diseases

Esophageal Diseases

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Nasopharyngeal	*Mechanical*	*Motility*
Nasal regurgitation Choking sensation Vomiting	Dysphagia to foods first Liquids later	Dysphagia to solids and liquids concurrently
Parkinson's Stroke Myasthenia Thyroid enlargement	Schatzki rings Peptic strictures Esophageal cancer	Diffuse esophageal spasm Systemic sclerosis Achalasia Scleroderma

GERD → Barrett's Esophagus → Adenocarcinoma of the Esophagus
Cigarette Smoking → Squamous cell carcinoma of the Esophagus

Question #13

Topic: Endocrinology & Metabolism

Subtopic: Stomach or Duodenum

Which of the following is NOT associated with Type A non-erosive gastritis?

A. Hypergastrinemia

B. Metaplasia

C. Antrum

D. Pernicious anemia

E. Achlorhydria

Answer #13

Topic: Gastroenterology
Subtopic: Stomach or Duodenum
Correct Answer: Choice C (Antrum)

Type A non-erosive gastritis is associated with four As (Autoantibodies, Achlorhydia, Atrophic, Anemia (pernicious)): The autoantibodies act against the parietal cells and intrinsic factor which cause achlorhydria and pernicious anemia, respectively. This leads to atrophic gastritis.

Non-erosive (atrophic) gastritis, defined as the inflammation of the lining of the stomach, can be broken into two categories:

- Type A gastritis primarily affects the body and fundus of the stomach.
- Type B gastritis, which is much more common than Type A, primarily affects the antrum.

Let's go over the answer choices:

- **Choice A** (Hypergastrinemia) is associated with type A atrophic gastritis. The low chloride and gastric acid level from the parietal cells cause a feedback mechanism to increase gastrin levels – thus, the patient would have hypergastrinemia. The low gastric acid levels cause gastrin levels to increase as a feedback mechanism, leading to atrophic gastritis.

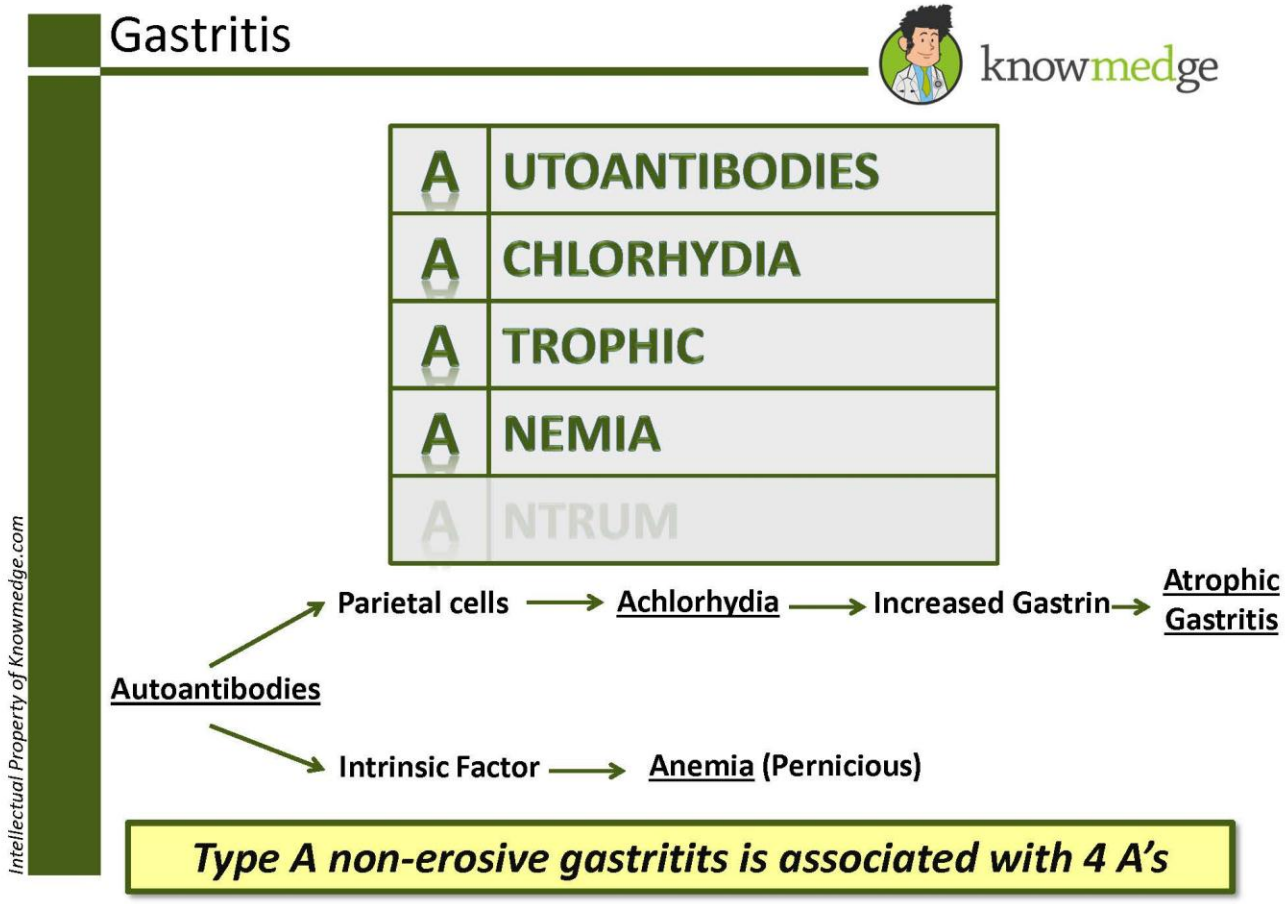
- **Choice B** (Metaplasia) is a universal feature of atrophic gastritis.

- **Choice C** (Located in antrum of stomach) is associated with type B gastritis.

- **Choice D** (Pernicious anemia) and **Choice E** (Achlorhydria) are both associated with type A atrophic gastritis as mentioned above.

Topic: Endocrinology & Metabolism

Subtopic: Stomach or Duodenum



Question #14

Topic: Gastroenterology

Subtopic: Liver Disease

Which of the following statements is true of focal nodular hyperplasia of the liver and/or hepatic adenoma?

A. Females seeking pregnancy who have a hepatic adenoma should undergo resection

B. Focal nodular hyperplasia of the liver has a greater chance of malignancy than hepatic adenoma

C. Hepatic adenoma is not hormone-responsive

D. Focal nodular hyperplasia of liver is hormone-responsive

E. Oral contraceptives will decrease the size of hepatic adenoma

Answer #14

Topic: Gastroenterology

Subtopic: Liver Disease

Correct Answer: Choice A (Females seeking pregnancy who have a hepatic adenoma should undergo resection)

Focal nodular hyperplasia is a benign condition of the liver. It is the second most common tumor of the liver, after hepatic hemangioma. Hepatic adenoma is an uncommon hormone-induced benign tumor of the liver. Both focal nodular hyperplasia of liver and hepatic adenoma are more common in women than men.

Let's go over the answer choices:

- **Choice A** is the correct answer. Hepatic adenoma can cause intraperitoneal bleeding especially in females seeking pregnancy or who are pregnant. As a result, any female with a hepatic adenoma who is pregnant or is seeking pregnancy should have the adenoma resected. Any female not seeking pregnancy and having a hepatic adenoma less than 5cm in diameter can discontinue OCPs and see if the size of adenoma decreases. If the size of the hepatic adenoma is greater than 5cm in diameter, resection should be performed just like in pregnant or seeking pregnancy patients.

- **Choice B** is incorrect. Focal nodular hyperplasia has a lesser tendency to transform into malignancy. Hepatic adenoma, on the other hand, has a greater risk for malignant transformation.

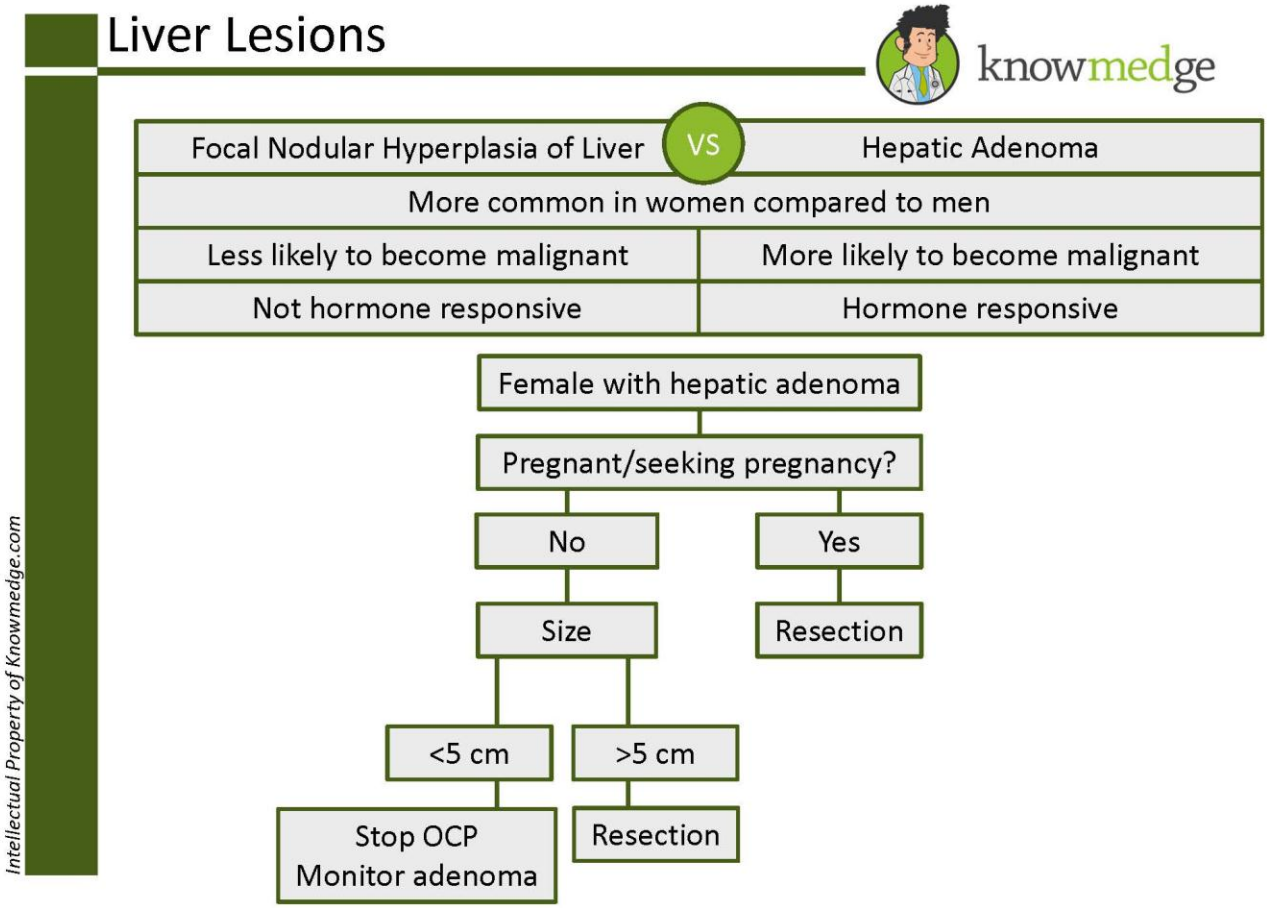
- **Choice C** is incorrect. Hepatic adenoma is hormone responsive, which means that females who take oral contraceptives (OCPs) may notice that the hepatic adenoma will shrink in size once they discontinue the OCPs.

- **Choice D** is incorrect. Focal nodular hyperplasia of liver is not hormone responsive

- **Choice E** is incorrect. Discontinuing oral contraceptives may decrease the size of the tumor in hepatic adenoma as described above.

Topic: Gastroenterology

Subtopic: Liver Disease



Question #15

Topic: Gastroenterology

Subtopic: Small Intestinal Disease

23-year-old female goes to medical school in the Caribbean islands to complete her basic science training. Due to her hectic study schedule, she is always eating out at fast food restaurants. After she completes her basic science training that lasted 18 months, she comes back to the United States for her clinical rotations. For a few months, she complains of diarrhea, abdominal pain and seven pound weight loss. Stool studies are all negative. The patient has mild anemia and increased mean corpuscular volume (MCV). Which of the following would you expect to find in this patient?

A. Increased folate, decreased vitamin B_{12}
B. Decreased folate, normal vitamin B_{12}
C. Normal folate, decreased vitamin B_{12}
D. Decreased folate, decreased vitamin B_{12}
E. None of the above

Answer #15

Topic: Gastroenterology

Subtopic: Small Intestinal Diseases

Correct Answer: Choice C (Normal folate, decreased vitamin B_{12})

Based on her diarrhea, abdominal pain, and weight loss, it appears this patient is likely experiencing tropical sprue. An individual needs to be in a tropical country for at least one month to consider this as a diagnosis. On labs, we may see mild anemia with an increased MCV. Tropical sprue is usually caused by E. coli or Klebsiella.

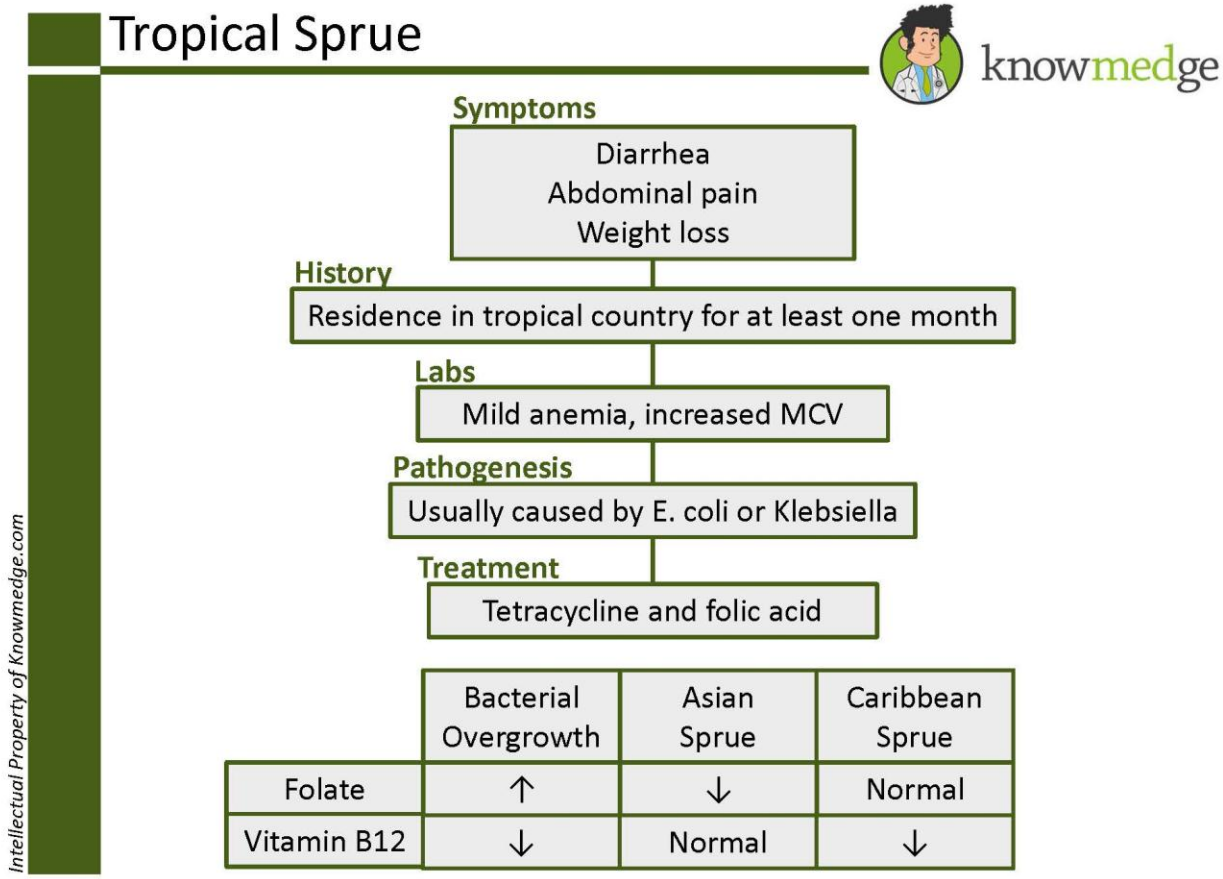
We need to be able to differentiate Caribbean tropical sprue, Asia tropical sprue, and small intestinal bacterial overgrowth when reviewing folate and vitamin B_{12} levels.

- Caribbean tropical sprue: Malabsorption disease found in tropical regions. This is characterized by normal folate and decreased vitamin B_{12} levels.
- Asian tropical sprue: Malabsorption disease found in Southern Asia. This is characterized by decreased folate and normal vitamin B_{12} levels.
- Small intestinal bacterial overgrowth: This is characterized by increased folate and decreased vitamin B_{12} levels.

Choice C (Normal folate, decreased vitamin B_{12}) is the correct answer and what you would expect to see from a patient experiencing Caribbean tropical sprue. Treatment of tropical sprue is usually with tetracycline and folic acid.

Topic: Gastroenterology

Subtopic: Small Intestinal Disease



Question #16

Topic: Gastroenterology

Subtopic: Pancreatic Disease

65-year-old male presents with chronic abdominal pain that radiates to the back. The patient has been experiencing this for the past five months. He says he doesn't have much of an appetite and as a result has lost about 30 pounds in the past five months. He also notices that he has been itching a lot and his skin color is turning yellow. You order liver function tests that show elevated a total bilirubin level of 12.4mg/dL and alkaline phosphatase level at 700U/L. Physical exam is significant for a cachexic individual. Eyes shows icterus present. Abdomen has diffuse tenderness present. CT abdomen shows a 3.5cm mass in the head of the pancreas and also dilatation of the common bile duct and pancreatic duct. He also has lesions present in the liver that seem to be metastasis of the cancer to the liver. Endoscopic ultrasound is done for confirmation and indeed does confirm that he has pancreatic adenocarcinoma. Which of the following is the next best step in management at this time?

A. Perform a Whipple procedure

B. Perform a distal pancreatectomy

C. Obtain a liver biopsy

D. Perform a endoscopic retrograde cholangiopancreatography (ERCP) with stent placement

E. Perform surgical resection and radiation therapy

Answer #16

Topic: Gastroenterology

Subtopic: Pancreatic Disease

Correct Answer: Choice D (D. Perform a endoscopic retrograde cholangiopancreatography (ERCP) with stent placement)

This patient's symptoms of decreased appetite, mid-epigastric pain, weight loss, jaundice, and pruritus are concerning for pancreatic carcinoma. In such patients, an obstructive picture would be expected on labs with an elevated bilirubin and alkaline phosphatase. A CT of the patient's abdomen did show a mass in the head of the pancreas, along with dilatation of the common bile and pancreatic ducts. Lesions in the liver were also noted. An endoscopic ultrasound then confirmed the diagnosis of pancreatic cancer.

Let's examine each of the choices to determine the best next step:

- **Choice A** (Whipple procedure) is also known as pancreaticoduodenectomy. This is done for cancers of the head of the pancreas that can be resected. This would include no metastasis or local invasions to the blood vessels. This patient has metastasis of the cancer to the liver so a Whipple procedure would not be a good idea.

- **Choice B** (Distal pancreatectomy) would be considered in pancreatic cancers of the body and tail and if the cancer is resectable. Again resection can be possible if there is only local invasion present.

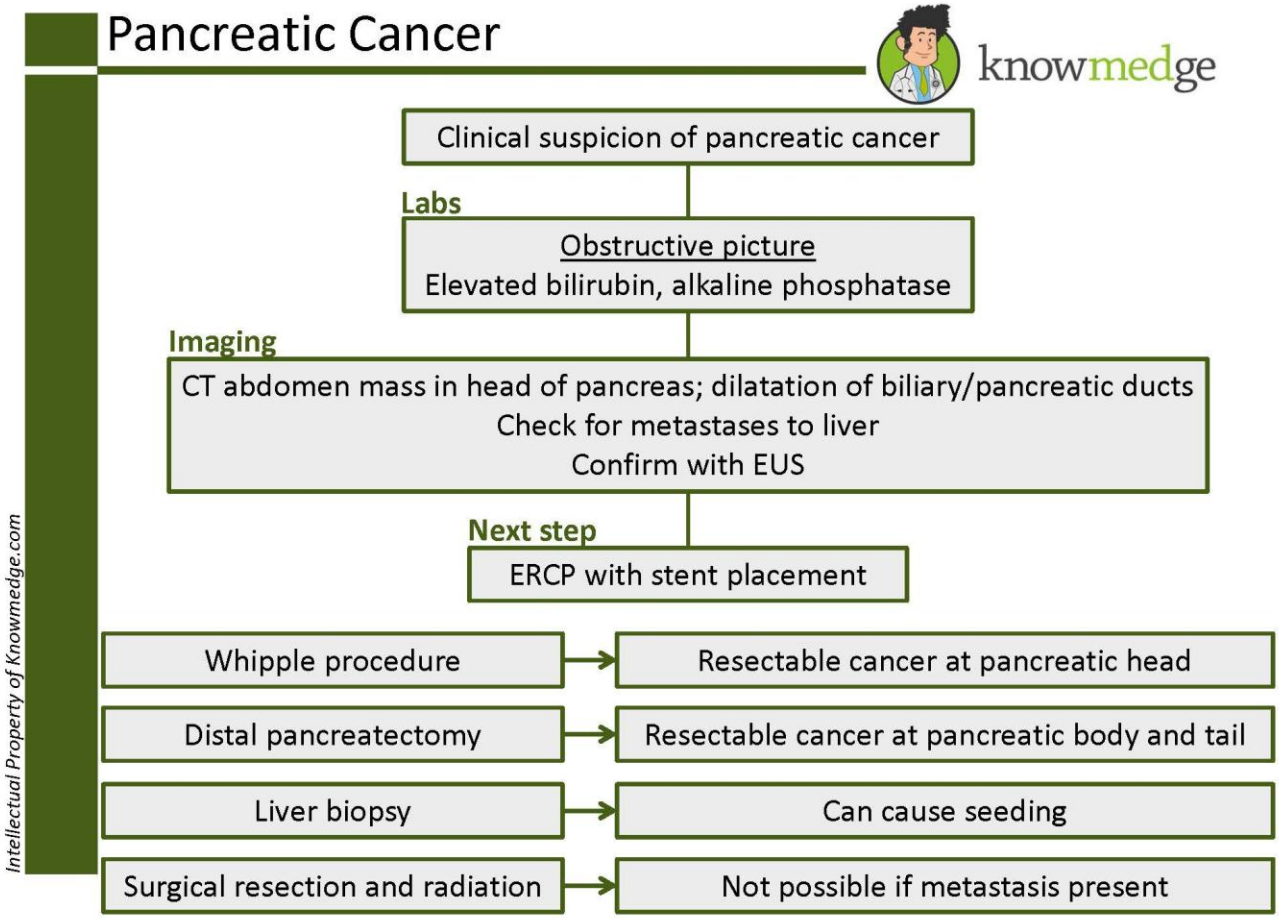
- **Choice C** (Liver biopsy) is not correct because lesions in the liver on CT are likely metastases. Also, performing a liver biopsy can cause further seeding.

- **Choice D** (ERCP with stent placement) is the correct answer. This patient has obstruction of common bile duct by the pancreatic mass that is causing dilatation of the common bile duct and jaundice to occur. You would want to do ERCP with stenting to control abdominal pain symptoms.

- **Choice E** (Surgical resection and radiation) is incorrect because this patient is beyond surgical resection since the cancer has metastasized.

Topic: Gastroenterology

Subtopic: Pancreatic Disease



Chapter

4

General Internal Medicine

Question #17

Topic: General Internal Medicine

Subtopic: Allergy/Immunology

Which of the following conditions can be a type I or even a type IV hypersensitivity reaction?

A. Condition where a patient with infectious mononucleosis has IgM cold agglutinin antibodies and a hemolytic reaction

B. Poison ivy dermatitis

C. Latex allergy

D. Arthritis in which anti-CCP is the most specific antibody

E. Allergic rhinitis

Answer #17

Topic: General Internal Medicine

Subtopic: Allergy/Immunology

Correct Answer: Choice C (Latex allergy)

There are four types of hypersensitivity reactions.

- Type I is IgE-mediated and occurs very quickly after exposure. It is associated with allergens such as bee stings, peanuts, latex and certain medications, to name a few. This can lead to a life-threatening condition called anaphylaxis.

- Type II hypersensitivity reactions are cytotoxic/antibody-mediated. Some examples in this category include hemolytic reactions, Goodpasture syndrome and hyperacute graft rejection.

- Type III is known as immune complex/IgG/IgM mediated and includes certain diagnoses like hypersensitivity pneumonitis, systemic lupus erythematosus, polyarteritis nodosa and serum sickness.

- Type IV is known as delayed or cell-mediated hypersensitivity reaction. Examples include chronic graft rejections, purified protein derivative (PPD), or exposure to latex, nickel or poison ivy.

A quick mnemonic to use to remember these is ACID:

- Type I – Allergic

- Type II – Cytotoxic

- Type III - Immune complex deposition

- Type IV – Delayed

Let's go over the answer choices:

- **Choice A** (Patient with infectious mononucleosis has IgM cold agglutinin antibodies and hemolytic reaction) is an example of a type II hypersensitivity reaction.

- **Choice B** (Patient with extreme itching due to poison ivy) is a cell mediated or type IV hypersensitivity reaction.

- **Choice C** (Latex allergy) can be a type I or type IV hypersensitivity reaction, which makes it the correct answer.

- **Choice D** (Arthritis in which anti-CCP is the most specific antibody) is describing rheumatoid arthritis. These patients will have immune complex or type III hypersensitivity reaction.

- **Choice E** (Allergic rhinitis) is a type I hypersensitivity reaction.

Topic: General Internal Medicine

Subtopic: Allergy/Immunology

Hypersensitivity Reactions

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Reaction	*Examples*
Type I	IgE-mediated reactions quickly after exposure Associated with allergens (e.g Bee stings, Peanuts, Latex, etc.)
Type II	Hemolytic reactions Goodpasture syndrome Hyperacute graft rejection
Type III	Hypersensitivity pneumonitis Systemic lupus erythematosus Polyarteritis nodosa Serum sickness
Type IV	Chronic graft rejections Purified protein derivative Latex, Nickel, Poison ivy

The mnemonic ACID (allergic, cytotoxic, immune complex, delayed) helps remember the rxn types

Question #18

Topic: General Internal Medicine

Subtopic: Epidemiology

In a study, 2,800 patients were examined.

- 1,000 patients who have a long standing history of alcoholism develop cirrhosis
- 750 patients who have long standing history of alcoholism do not develop cirrhosis
- 50 patients who don't drink alcohol develop cirrhosis
- 1,000 patients who don't drink alcohol don't develop cirrhosis

What is the relative risk ratio (RRR) of patients who drink alcohol and develop liver cirrhosis versus patients who don't drink alcohol but still develop liver cirrhosis?

A. 5

B. 12

C. 20

D. 40

E. 100

Answer #18

Topic: General Internal Medicine

Subtopic: Epidemiology

Correct Answer: Choice B (12)

Relative risk ratio (RRR) is the ratio of incidence of developing a disease when exposed to a risk factor divided by the incidence of developing a disease when not exposed to that risk factor. We know that alcohol can cause cirrhosis of the liver. To calculate the relative risk ratio, we first take the number of people who develop cirrhosis when exposed to alcohol (1,000) and divide it by the total number of patients who drink alcohol (1000+750) or 1000/1750. We then calculate the incidence of cirrhosis in patients who were not exposed to alcohol (50) and divide it by the total number of patients who don't drink alcohol (1000+50) or 50/1050. We now take 1000/1750 and divide it by 50/1050 to get Choice B (12). This means that the incidence of cirrhosis of liver is increased by 12 times in patients exposed to alcohol.

The best way to understand this is by variables

A = incidence of disease with exposure

B = no disease with exposure

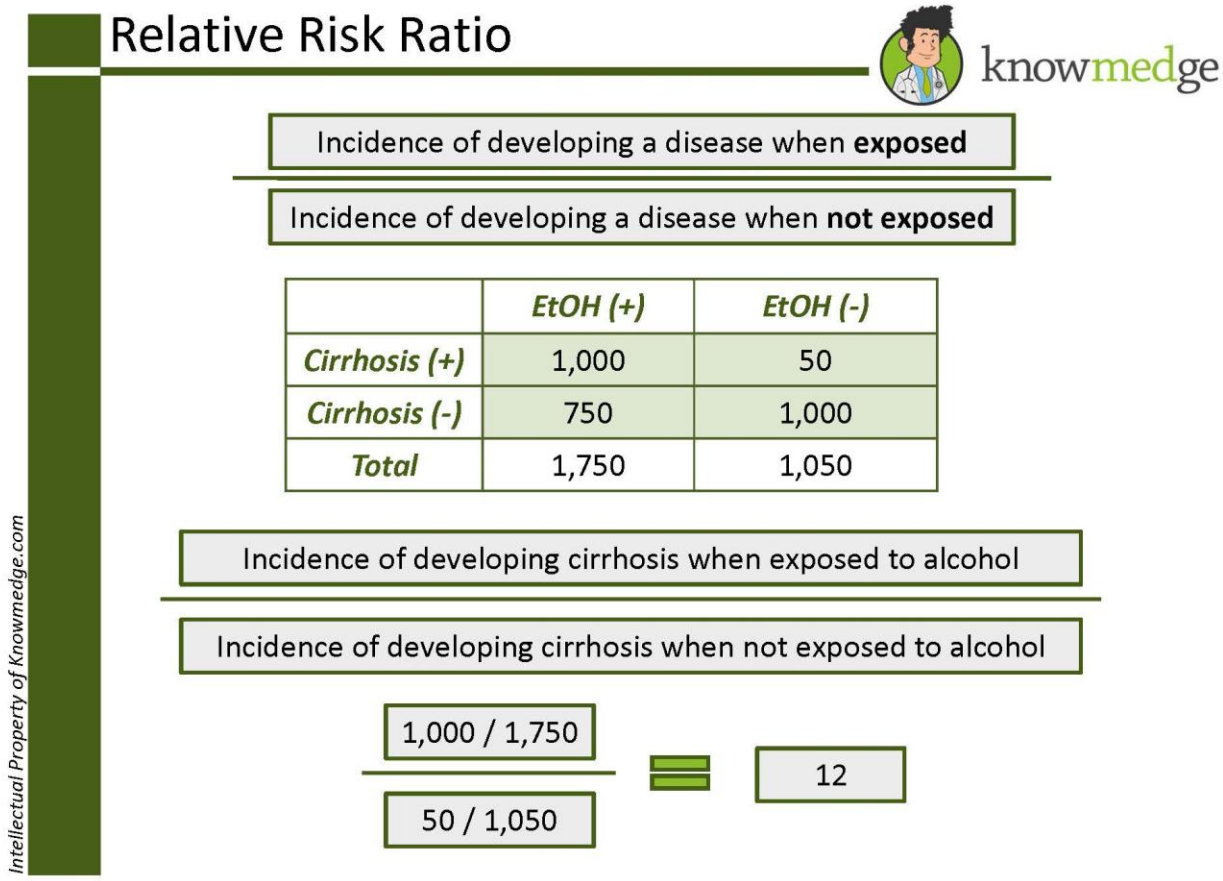
C = incidence of disease without exposure

D = no disease without exposure

The general formula for relative risk ratio is A/(A+B) and divide this by C/(C+D).

Topic: General Internal Medicine

Subtopic: Epidemiology



Relative Risk Ratio

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$$\frac{\text{Incidence of developing a disease when } \textbf{exposed}}{\text{Incidence of developing a disease when } \textbf{not exposed}}$$

	Risk Factor(+)	*Risk Factor(-)*
Disease(+)	A	C
Disease(-)	B	D
Total	A+B	C+D

$$\frac{A / (A+B)}{C / (C+D)}$$

Question #19

Topic: General Internal Medicine
Subtopic: Ophthalmology

29-year-old female presents to the office complaining of double vision. She also mentions she has been feeling a tingling sensation in her arms. She denies any pain but mentions feeling fatigued. During your discussion with her you notice a slight hand spasm. Eye examination reveals internuclear ophthalmoplegia. Based on this little bit of history and the patient's likely condition, which of the following would you not expect for the patient?

A. Internuclear ophthalmoplegia
B. Hyperreflexia
C. Decreased attention span
D. Vomiting
E. Bladder dysfunction

Answer #19

Topic: General Internal Medicine
Subtopic: Ophthalmology
Correct Answer: Choice D (Vomiting)

Based on this patient's symptoms, she is likely suffering from multiple sclerosis (MS). Multiple sclerosis is a disease where the body's own immune system attacks the myelin sheath (protective covering surrounding nerve cells) leading to a slowdown in nerve signals. The exact cause of this disease is not known. MS is more common in women than men and is generally seen between the ages of 20 and 40. Symptoms vary greatly depending on the amount of nerve damage. It can include:

- Muscle symptoms (Problems walking and moving arms/legs, tremor, muscle spasms, loss of balance, weakness/numbness in limbs)
- Eye symptoms (Double vision, internuclear ophthalmoplegia, loss of central vision - often in just one eye)
- Brain / nerve symptoms (Decreased attention span, memory loss, dizziness, hearing loss)
- Speech / swallowing symptoms (Slurred speech, difficulty chewing / swallowing food)
- Bowel / bladder symptoms (Urine incontinence, constipation, frequent need to urinate, difficulty urinating)
- Sexual symptoms (Problems with erection, vaginal dryness, loss of libido)
- Other symptoms (Fatigue, tingling in the arms/legs)

Let's go through the answer choices to find a clinical sign that is least likely to be expected in MS patients.

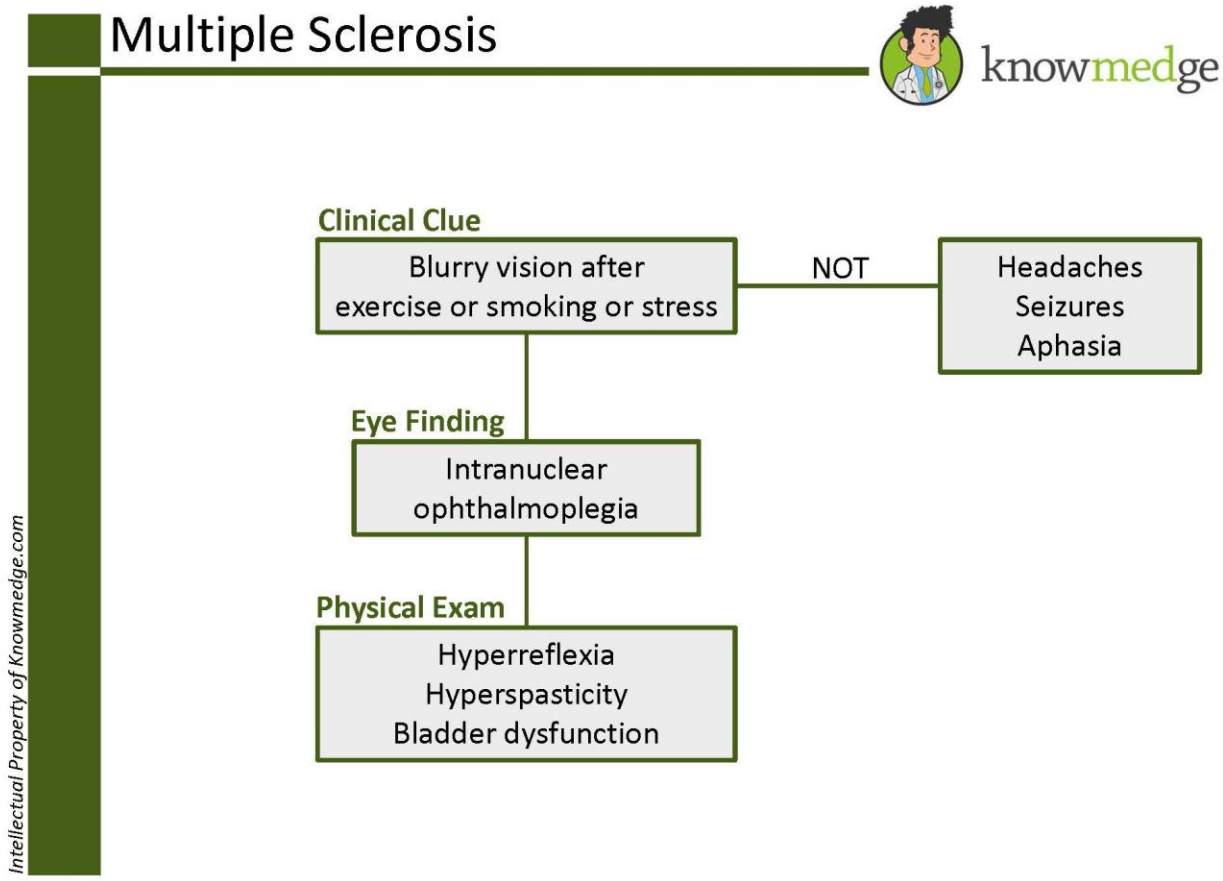
- **Choice A** (Internuclear ophthalmoplegia) can be a feature that is seen in MS patients. In this condition, patients have lack of on ipsilateral adduction to a contralateral gaze. For example, when an individual is asked to look to the right, the right eye will abduct and left eye would adduct normally. In MS patients, the right eye will be able to abduct but there is lack of adduction of the left eye when the patient is

supposed to look to the right. The lesion for this condition, therefore, would be left medial longitudinal fasiculus (MLF) lesion.

- **Choice B** (Hyperreflexia) or increased reflexes would also be expected to be seen in a patient with MS.
- **Choice C** (Decreased attention span) would also be expected in MS patients.
- **Choice D** (Vomiting) is not a likely symptoms for a patient with multiple sclerosis.
- **Choice E** (Bladder dysfunction) is a feature that can be seen with MS patients.

Topic: General Internal Medicine

Subtopic: Ophthalmology



Question #20

Topic: General Internal Medicine

Subtopic: ENT

18-year-old male presents to the clinic with right ear pain and redness of the eardrum that he has been experiencing for one week. He denies any drainage from the ear. On physical exam, he does not have pain when you tug the pinna of his right ear. With otoscopic examination, you visualize fluid in the middle ear and erythema of the tympanic membrane. Patient has no known drug allergies. What is the most efficacious treatment for this condition?

A. Ciprofloxacin

B. Cefdinir

C. Azithromycin

D. Polymyxin ear drops

E. Amoxicillin

Answer #20

Topic: General Internal Medicine

Subtopic: ENT

Correct Answer: Choice E (Amoxicillin)

There are three main types of ear infections:

- Acute otitis media (AOM): Usually painful with common presenting symptoms of fever and redness of eardrum. Treatment is typically with antibiotics.

- Otitis media effusion (OME): Occurs as a result of buildup of fluid in the middle ear and generally will not present with symptoms of an acute infection. This is generally not a painful condition and will usually not benefit from antibiotic treatment. The infection typically goes away on its own.

- Otitis externa: This is an infection of the ear and/or outer ear canal. It is more commonly known as swimmer's ear. Symptoms include itching, pain and redness around the ear. Treatment is typically with antibiotics.

From the patient's history and physical exam, he likely has acute otitis media . On physical exam, an erythematous, bulging tympanic membrane is seen. As this patient doesn't have any known drug allergies, the best treatment is Choice E (Amoxicillin).

Let's go over the incorrect answer choices:

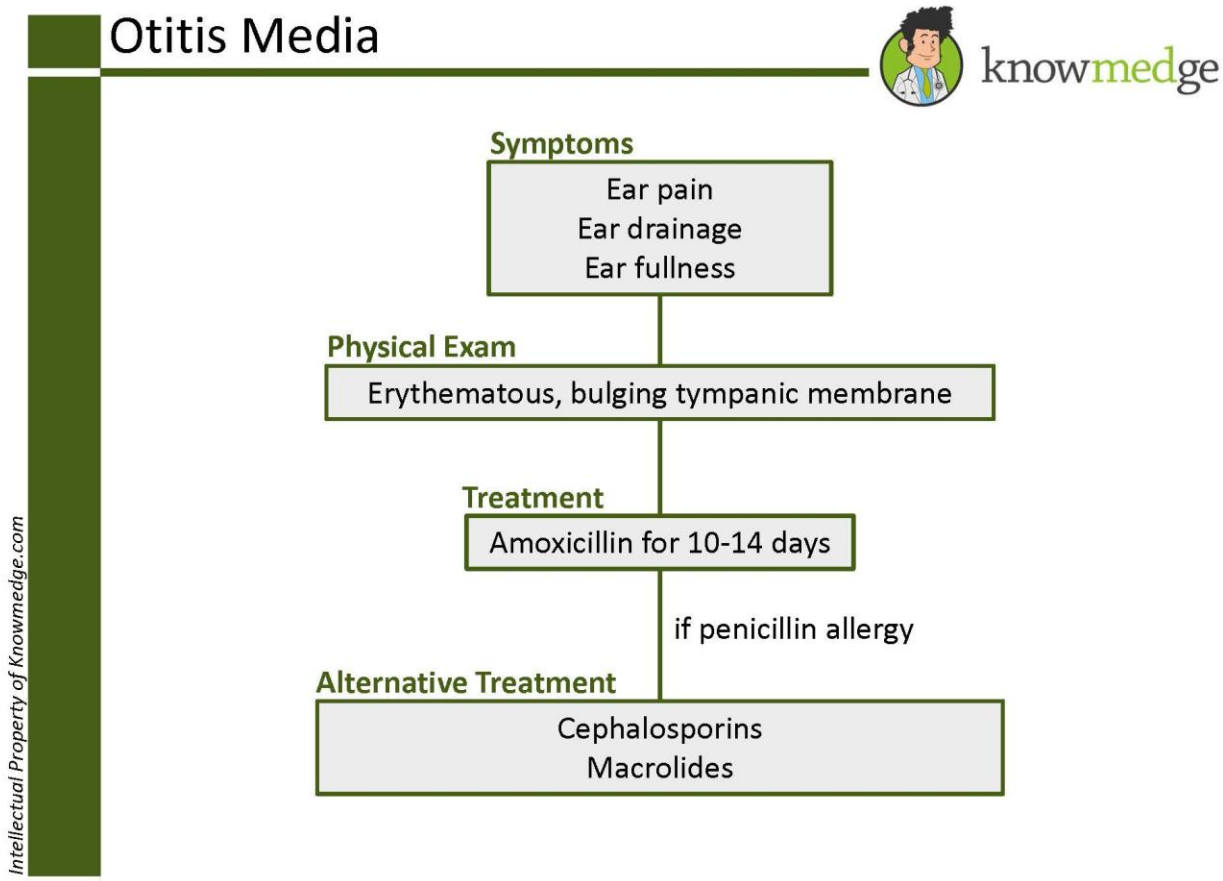
- **Choice A** (Ciprofloxacin) is usually not recommended for the treatment of otitis media.

- **Choice B** (Cephalosporins) and Choice C (Macrolides) can be used if patients have a penicillin allergy.

- **Choice D** (Polymyxin) would be used for otitis externa or swimmer's ear.

Topic: General Internal Medicine

Subtopic: ENT



Chapter

5

Hematology

Question #21

Topic: Hematology
Subtopic: Myeloproliferative Disorders

54-year-old male presents to your office for fatigue, dizziness, and headaches. He also notices that after he takes a warm bath, he starts to itch. He complains of early satiety for the past few months. He says that there is some pain and redness and warmth over his lower extremities. On physical exam, he has splenomegaly and redness and warmth over his extremities. Labs indicate a hematocrit level of 63% and a positive JAK2 mutation. Which of the following is the least likely to be true of the condition this patient is suffering from?

A. Epo level will be decreased
B. Mainstay of treatment is phlebotomy and aspirin
C. PO_2 level will be normal
D. Iron deficiency anemia will be present
E. Retinal vein involvement is more common than splenomegaly in this condition

Answer #21

Topic: Hematology

Subtopic: Myeloproliferative Disorders

Correct Answer: Choice E (Retinal vein involvement is more common than splenomegaly in this condition)

Based on the patient's clinical symptoms and diagnostic lab findings, he likely has polycythemia vera, a bone marrow disease in which there is overproduction of red blood cells. This hyper-viscosity can lead to thrombus formation (blood clot). Presenting symptoms include:

- Dizziness
- Headaches
- Early satiety (from splenomegaly)
- Itching after taking a warm bath
- Pain and redness
- Warmth in extremities (known as erythromelalgia)

This condition is diagnosed when the hematocrit level (% of red blood cells in the blood) is greater than 60% and the patient has a JAK2 mutation present. It can be associated with leukocytosis and thrombocytosis. The mainstay of treatment is phlebotomy and aspirin which can bring the hematocrit to a normal level (lower than 45%) and decrease the risk of thrombosis. If aspirin is contraindicated because of bleeding or platelet dysfunction and a patient cannot tolerate phlebotomy, then hydroxyurea can be used.

Let's go through the answer choices:

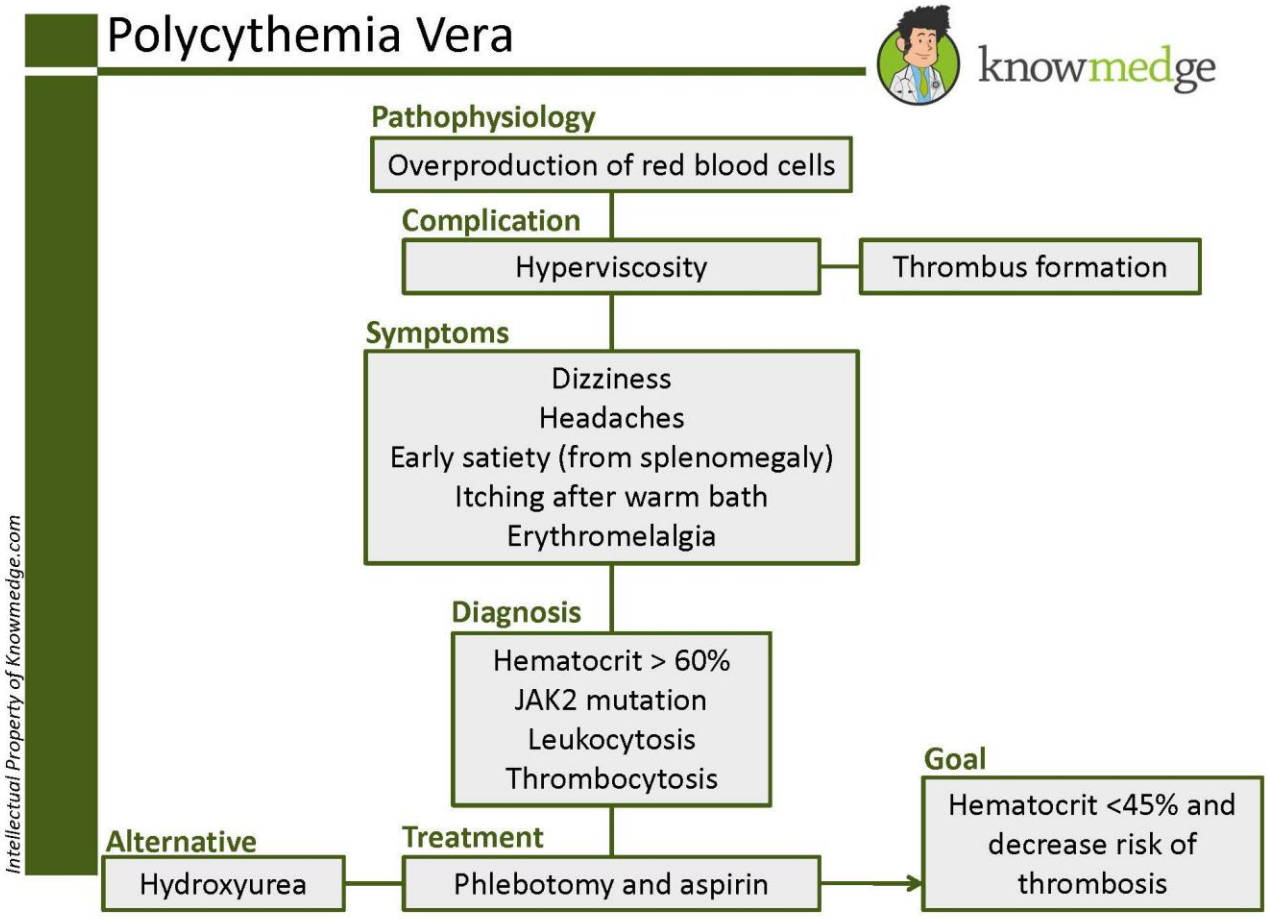
- **Choice A** (Epo level will be decreased) is a true statement because if the red blood cell (RBC) mass is increased, then the epo level would be decreased.
- **Choice B** (Mainstay of treatment is phlebotomy and aspirin) is a true statement.
- **Choice C** (Normal PO_2 level) is also true with polycythemia vera.

- **Choice D** (Iron deficiency anemia) is also a true statement. Patients may have iron deficiency anemia with polycythemia vera.

- **Choice E** (Retinal vein involvement is more common than splenomegaly) is the least likely to be true. Splenomegaly (enlarged spleen) is more common than retinal vein involvement in polycythemia vera. A clue that a patient may have splenomegaly is complaints of early satiety.

Topic: Hematology

Subtopic: Myeloproliferative Disorders



Question #22

Topic: Hematology

Subtopic: Hemoglobinopathies and Thalassemias

Which of the following best depicts Cooley's anemia?

A. Decreased MCV, increased hemoglobin A2, increased hemoglobin F
B. Decreased MCV, decreased hemoglobin A2, increased hemoglobin F
C. Increased MCV, increased hemoglobin A2, increased hemoglobin F
D. Increased MCV, decreased hemoglobin A2, increased hemoglobin F
E. Increased MCV, increased hemoglobin A2, decreased hemoglobin F

Answer #22

Topic: Hematology

Subtopic: Hemoglobinopathies and Thalassemias

Correct Answer: Choice A (Decreased MCV, increased hemoglobin A2, increased hemoglobin F)

Cooley's anemia is another name for beta thalassemia major. Beta thalassemia can be mild, intermediate or major (Cooley anemia). Beta thalassemia is condition where there is a problem with the production of the beta chain of hemoglobin. When there is decreased production of beta chain, it will lead to increased HbA2 levels. An increase of HbA2 will only occur with beta chain production problems. All beta thalassemias will have an increased hemoglobin F, which has a greater affinity for carrying oxygen to help compensate for the drop in normal hemoglobin.

Mean corpuscular volume (MCV) will be decreased with any form of beta thalassemia.

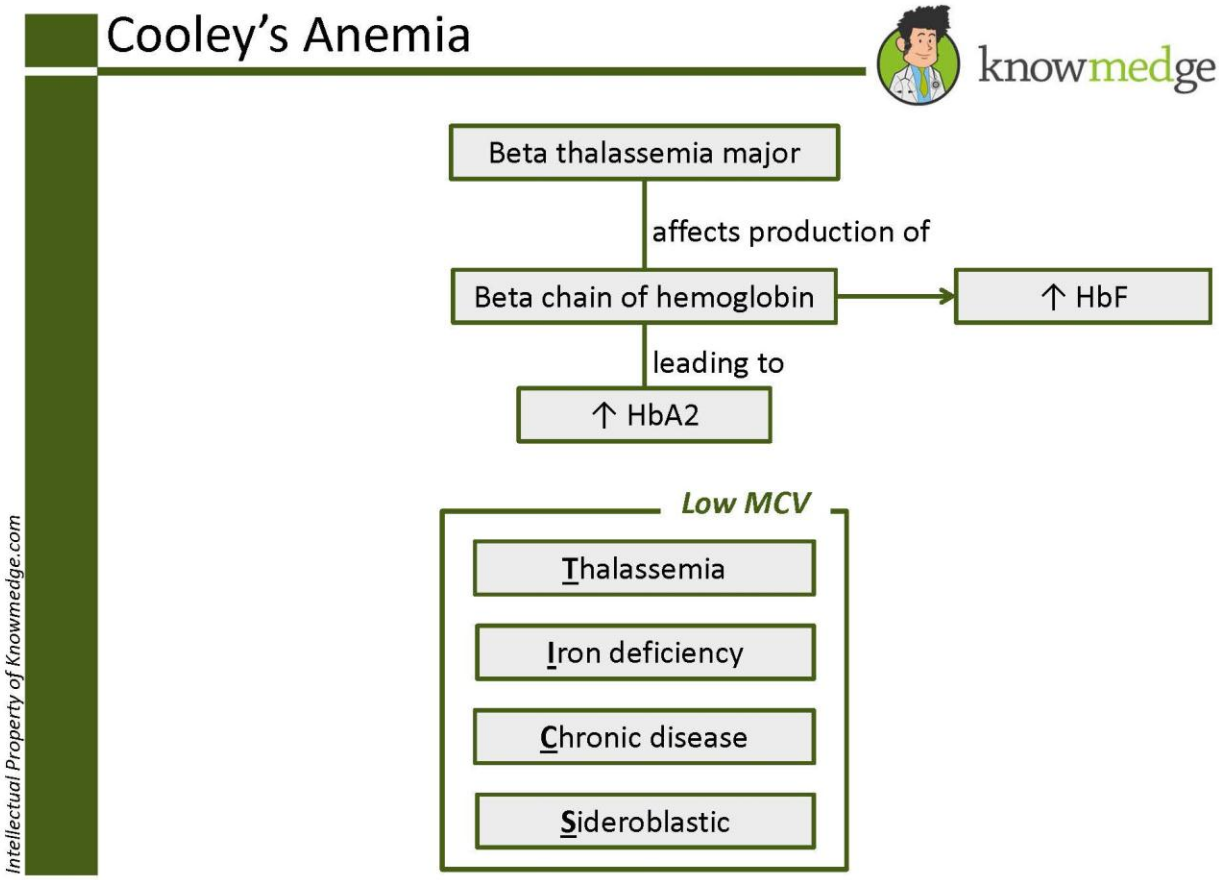
TICS is a mnemonic for causes of low MCV (microcytic anemia).

- T – Thalassemia
- I - Iron deficiency anemia
- C - Chronic disease
- S - Sideroblastic anemia

As a result, **Choice A** (Decreased MCV, increased hemoglobin A2, increased hemoglobin F) is what you would most likely see in a patient with Cooley's anemia.

Topic: Hematology

Subtopic: Hemoglobinopathies and Thalassemias



Question #23

Topic: Hematology

Subtopic: Platelet Disorders

Which of the following is least likely to have dysfunctional platelets causing thrombocytopenia?

A. Multiple myeloma

B. Renal failure

C. Ethylenediaminetetraacetic acid (EDTA)

D. Glanzman's disease

E. Bernard-Soulier disease

Answer #23

Topic: Hematology

Subtopic: Platelet Disorders

Correct Answer: Choice C (Ethylenediaminetetraacetic acid (EDTA))

Thrombocytopenia is a bleeding disorder characterized by a low blood platelet count.

Bleeding disorders are broken down into primary hemostasis and secondary hemostasis:

- Primary hemostasis is due to platelet problems and will have an elevated bleeding time.
- Secondary hemostasis is due to coagulation factor problems.

Platelet disorders can be arise due to dysfunctional platelets or a decreased number of platelets. Some of the causes of dysfunctional platelets include:

- Von Willebrand disease
- Glanzman's disease
- Bernard-Soulier disease
- Multiple myeloma
- Renal failure
- Cyclooxygenase inhibitors

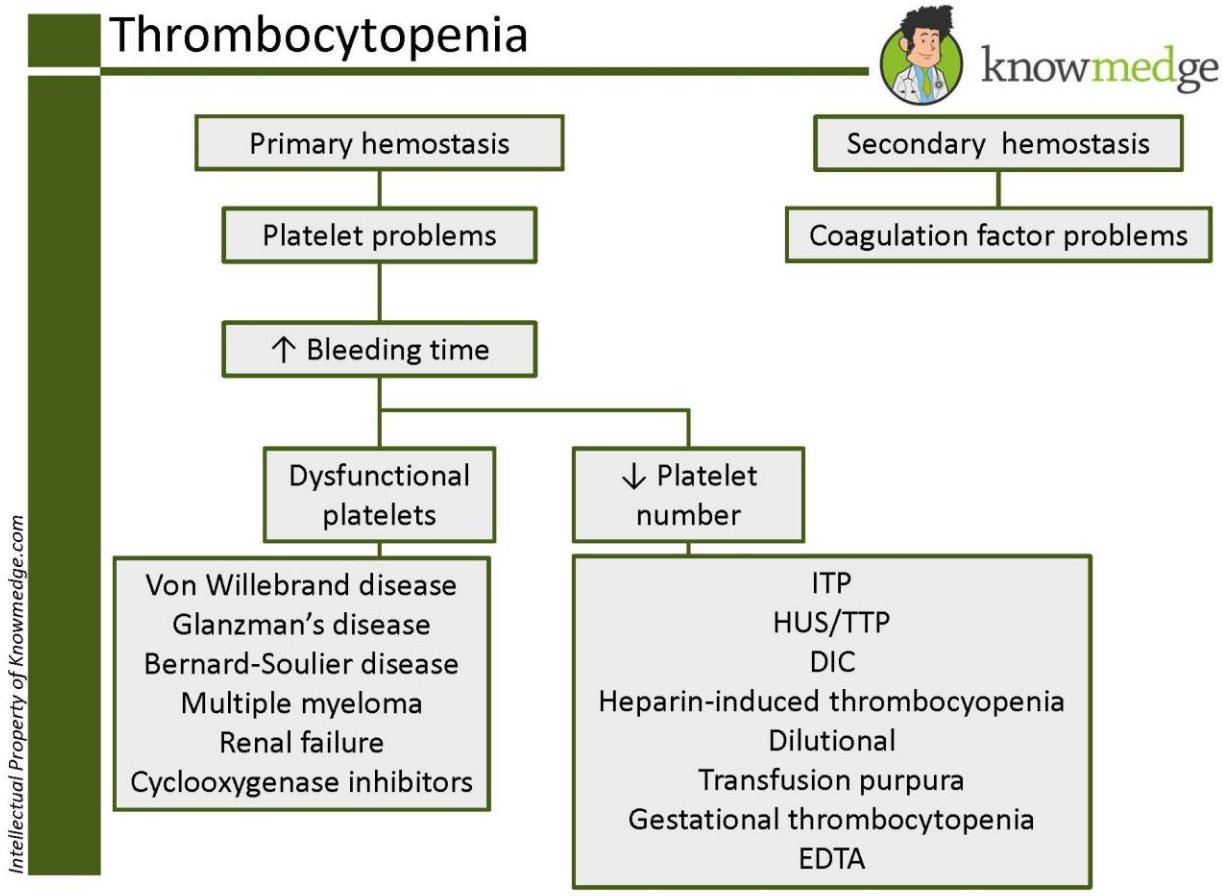
Some examples of problems that decrease platelets include:

- Idiopathic thrombocytopenic purpura (ITP)
- Hemolytic uremic syndrome / thrombotic thrombocytopenic purpura (HUS/TTP)
- Disseminated intravascular coagulation (DIC)
- Heparin induced thrombocytopenia
- Dilutional
- Transfusion purpura
- Gestational thrombocytopenia
- EDTA

Choice C (EDTA) is the correct answer. EDTA is an anticoagulant that causes platelet clumping in some patients and would result in pseudothrombocytopenia. We should consider this problem in someone who has normal platelets and the next day has a significant drop in platelets without signs of bleeding.

Topic: Hematology

Subtopic: Platelet Disorders



Question #24

Topic: Hematology

Subtopic: Hemolytic Anemias

36-year-old female presents to clinic for a routine physical. She complains of some dizziness. She denies heavy menstrual bleeding or any other signs of bleeding. She admits that she has a family history of anemia. Labs indicate that she has a hemoglobin of 8.7g/dL. Reticulocyte count is elevated along with LDH and indirect bilirubin. She denies any recent upper respiratory infection or use of antibiotics. Coomb's test is negative. The patient's osmotic fragility test comes back positive. Which of the following is the likely mechanism of her underlying condition?

A. Glutamate-to-valine point mutation

B. Enzyme deficiencys

C. Membrane defect

D. CD55 or CD59 deficiency

E. Iron deficiency

Answer #24

Topic: Hematology

Subtopic: Hemolytic Anemias

Correct Answer: Choice C (Membrane defect)

This patient likely has hereditary spherocytosis. The clue to this condition is a family history of anemia and a positive osmotic fragility test (that reveals increased breakdown of red blood cells). The reduced surface-to-volume ratio makes the spherocytes more susceptible to osmotic stress. Since hereditary spherocytosis is a hemolytic anemia, we would expect to see an increased reticulocyte count, increased LDH, and increased indirect bilirubin. Furthermore, if we checked a haptoglobin level, it would be decreased like other hemolytic processes.

Let's go through the answer choices:

- **Choice A** (Glutamate-to-valine point mutation) would be seen in sickle cell problems. It occurs because of a point mutation of the Beta globin chain.

- **Choice B** (Enzyme deficiency) is incorrect. This patient does not have any exposure to certain medications/foods like primaquine, fava beans, dapsone, TMP/SMZ, or quinine to suggest this disorder.

- **Choice C** (Membrane defect) is the correct answer for hereditary spherocytosis. There is a problem in the cytoskeleton membrane protein spectrin that causes membrane flexibility to decrease. Thus, it becomes more susceptible to hemolysis. The spherocytes can cause gallstones to occur.

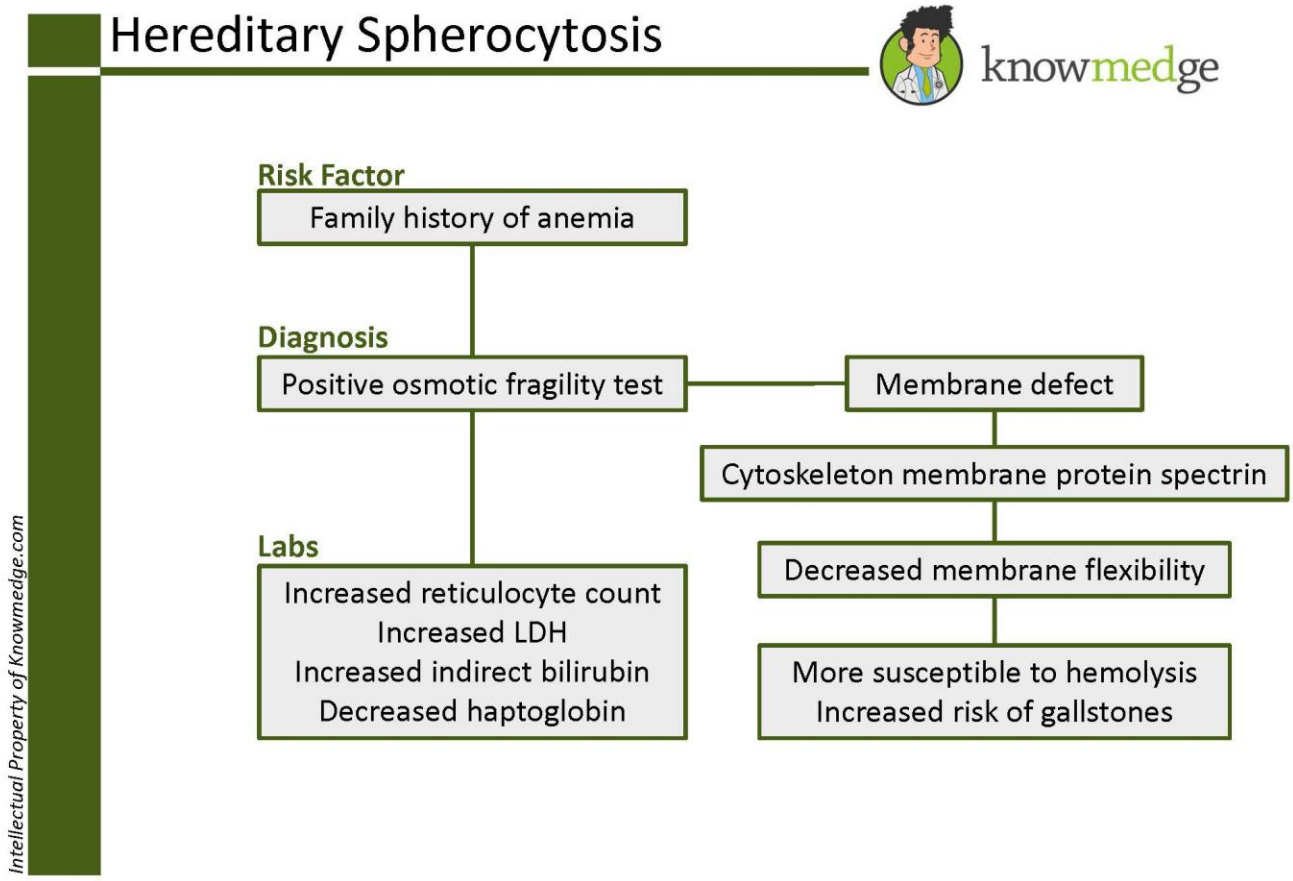
- **Choice D** (CD55 or CD59 deficiency) would be seen in paroxysmal nocturnal hematuria (PNH). With PNH, there is unopposed complement-mediated hemolysis that occurs because of loss of anchor membrane proteins that would normally protect against this hemolysis. It presents with arterial or venous thrombosis and also would have a urinalysis showing blood without red blood cells.

- **Choice E** (Iron deficiency) is not correct as the patient does not give history of any bleeding that would cause iron deficiency anemia to develop. Bleeding excessively will cause an increased reticulocyte

count, but iron deficiency anemia is one of the causes of a low reticulocyte count. This patient has a high reticulocyte count.

Topic: Hematology

Subtopic: Hemolytic Anemias



Chapter

6

Infectious Disease

Question #25

Topic: Infectious Disease
Subtopic: CNS Infections

45-year-old female presents to the ED with fever and headaches, a condition she has been experiencing for the past two days. Physical exam reveals neck stiffness concerning for meningitis. Lumbar puncture is performed and cerebrospinal fluid (CSF) studies are obtained. Opening pressure is noted at 300mmH_2O. CSF analysis reveals: 2,000 WBCs/μL, PMN predominance, no RBCs, glucose 24mg/dL and protein 106mg/dL. Serum glucose is 86mg/dL. Which of the following is the most likely diagnosis?

A. Encephalitis
B. HSV encephalitis
C. Early bacterial meningitis
D. West Nile virus
E. Bacterial meningitis

Answer #25

Topic: Infectious Disease

Subtopic: CNS Infections

Correct Answer: Choice C (Early bacterial meningitis)

Meningitis may result from:

- Infectious or non-infectious causes
- Acute or chronic in timeframe
- Bacterial or non-bacterial in etiology

Of the different types of meningitis, the one that requires the most urgent treatment is acute bacterial meningitis. This is also the most common form of meningitis. Two-thirds of patients with bacterial meningitis present with fever, neck stiffness (nuchal rigidity) and altered mental status.

To determine the cause of meningitis, a lumbar puncture with cerebrospinal fluid (CSF) analysis is performed. CSF opening pressure is between 200-500mmH_2O in bacterial meningitis while it is less than 250mmH_2O in viral cases. Leukocyte count is also higher in bacterial cases: 1,000-5,000/μL versus 50-1,000/μL in viral cases.

The differential is a neutrophil-dominant WBC count in bacterial meningitis and a lymphocytic-dominant WBC count in viral meningitis. A mnemonic for remembering that CSF glucose is lower in bacterial infections (less than 40mg/dl versus greater than 45mg/dL) is that the bacteria eat up the glucose, lowering its level. Similarly, protein levels are lower in viral infections but this is not as definitive as there is overlap in the respective ranges of 100-500mg/dL for bacterial and less than 200mg/dL for viral.

Like most other viral-caused infections, patients with meningitis will have a negative Gram stain and culture while the majority of patients with bacterial meningitis will have positive results.

This patient's CSF glucose of 24mg/dL and elevated leukocytes point to a bacterial cause. To distinguish the timeframe of bacterial meningitis, a CSF-to-serum glucose ratio is calculated. If this ratio is less than 0.4, early bacterial meningitis is the likely diagnosis. As this patient's CSF-to-serum glucose ratio is 0.3, the best answer is **Choice C** (Early bacterial meningitis) and **Choice B** (HSV encephalitis) would be likely if RBCs were noted in the CSF.

Topic: Infectious Disease

Subtopic: CNS Infections

Meningitis

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Bacterial		*Viral*
200-500	**Opening pressure (mmH_2O)**	≤250
1,000-5,000	**Leukocyte count (/µl)**	50-1,000
Neutrophils	**Leukocyte differential**	Lymphocytes
<40	**Glucose (mg/dl)**	>45
100-500	**Protein (mg/dl)**	<200
Positive in about 60-90% of patients	**Gram stain**	Negative
Positive in about 75% of patients	**Culture**	Negative

Question #26

Topic: Infectious Disease

Subtopic: Lower Resp Infections

Which of the following scenarios is it appropriate to allow outpatient treatment for community acquired pneumonia (CAP)?

A. 67-year-old male with CAP and confusion

B. 68-year old male with CAP and respiratory rate of 18/min

C. 69-year old female with CAP and creatinine of 2.1mg/dL (Baseline is 0.8mg/dL)

D. 58-year old female with CAP, low blood pressure, and some confusion

E. 32-year-old female with CAP, altered mental status, respiratory rate 34/min, and blood pressure of 90/50mmHg

Answer #26

Topic: Infectious Disease
Subtopic: Lower Resp Infections
Correct Answer: Choice B (68-year old male with CAP and respiratory rate of 18/min)

After diagnosing a patient with community-acquired pneumonia, we must determine whether the patient needs to be hospitalized or not. In order to facilitate this decision, the CURB-65 guidelines can be used. CURB stands for:

- C – Confusion
- U – Uremia
- R - Respiratory rate greater than 30/minute
- B - Blood pressure that is low
- 65 - Age 65 years or greater

Each category is assigned 1 point

- 0-1 points total means the patient can be treated as an outpatient
- 2 points total requirements treatment in the medical ward
- 3 or more points requires ICU admission

Let's go over the answer choices:

- **Choice A** (67-year-old male with CAP and confusion) has 2 points (age greater than 65 and confusion) and should require admission to the medical ward.

- **Choice B** (68-year-old male with CAP and respiratory rate of 18/min) will be the scenario that will require outpatient therapy. This patient only has one point (age greater than 65) so he can be treated for CAP as an outpatient.

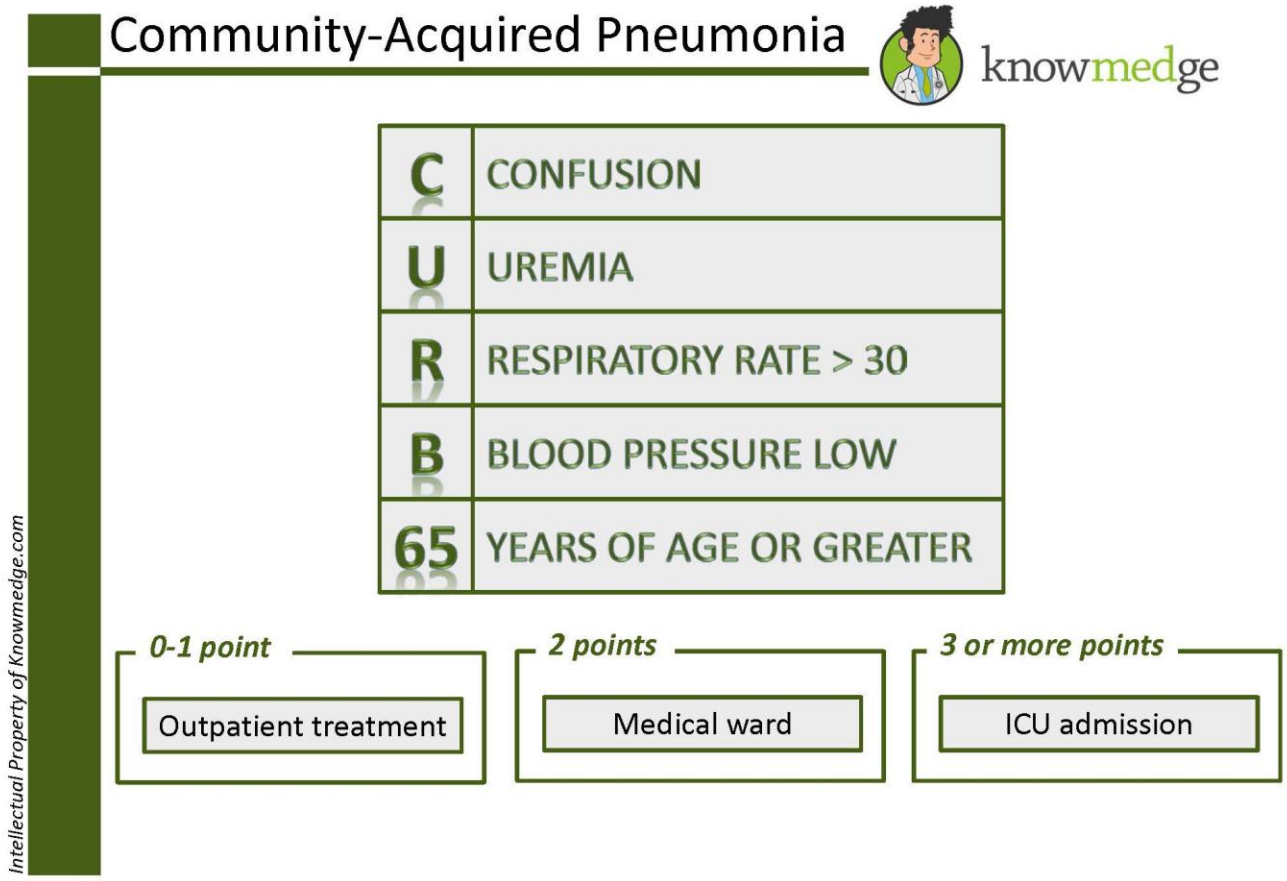
- **Choice C** (69-year old female with CAP and creatinine of 2.1mg/dL) has 2 points (age greater than 65 and compromised renal function) which means admission to medical ward is most appropriate.

- **Choice D** (58-year old female with CAP, low blood pressure, and some confusion) has 2 points (low blood pressure and confusion). Even though this patient has 2 points, this patient may require ICU admission because the patient may be septic. For such scenarios, the CURB score simply serves a guideline but the clinical picture plays a bigger role in deciding where the patient will receive the most appropriate care.

- **Choice E** (32-year-old female with CAP, altered mental status, respiratory rate 34/min, and blood pressure of 90/50mmHg) has 3 points (altered mental status, respiratory rate greater than 30/min and low blood pressure) that will require patient to go to the ICU.

Topic: Infectious Disease

Subtopic: Lower Resp Infections



Question #27

Topic: Infectious Disease

Subtopic: STDs

Which of the following is correct regarding syphilis?

A. Secondary syphilis is associated with foot drop and wide based gait

B. VDRL and RPR are specific tests for syphilis

C. Tertiary syphilis is associated with pupils being able to constrict to light

D. Female patient with syphilis who is pregnant and allergic to penicillin should receive ceftriaxone

E. Secondary syphilis is associated with "nickel and dime" lesions on palms and soles

Answer #27

Topic: Infectious Disease

Subtopic: STDs

Correct Answer: Choice E (Secondary syphilis is associated with "nickel and dime" lesions on palms and soles)

Stages of syphilis:

- Primary syphilis is associated with a painless ulcer that is called a chancre and is diagnosed with darkfield microscopy.
- Secondary syphilis is associated with lesions on the palms and soles that look like nickels and dimes.
- Tertiary syphilis (also known as neurosyphilis) is associated with aortitis and neurological manifestations.

Choice E (Secondary syphilis is associated with "nickel and dime" lesions on palms and soles) is the correct answer.

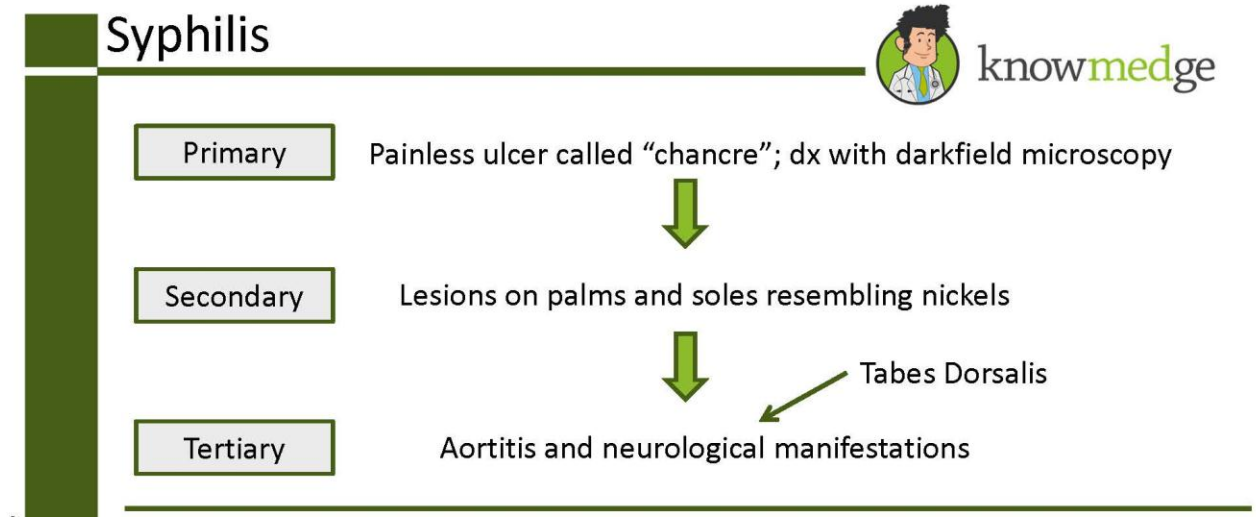
Let's go over the other answer choices:

- **Choice A** (Secondary syphilis is associated with foot drop and wide based gait): This is describing tabes dorsalis, a condition where patient has foot slapping and wide based gait. Tabes dorsalis is actually a part of neurosyphilis, which makes this choice incorrect.
- **Choice B** (VDRL and RPR are specific for syphilis): MHA-TP and FTA-ABS are specific tests for syphilis while VDRL and RPR are not so Choice B is incorrect.
- **Choice C** (Tertiary syphilis is associated with pupils being able to constrict to light): Argyll Robinson pupil is one that is able to constrict to accommodation and not to light. Choice C is saying that it is able to constrict to light in tertiary syphilis which is the wrong answer.
- **Choice D** (Female patient who is pregnant and allergic to penicillin should receive ceftriaxone) : The best approach to treating a pregnant woman who is allergic to PCN is to first desensitize her and then

give her PCN, making Choice D incorrect also. In non-pregnant patients with syphilis, PCN desensitization and administration is also the preferred treatment but doxycycline can be given instead.

Topic: Infectious Disease

Subtopic: STDs



Clinical Clue	*Description*
MHA-TP FTA-ABS	Specific tests for syphilis
VDRL RPR	Non-specific tests for syphilis
Argyll Robertson pupil	Constricts to accommodation but not light

Question #28

Topic: Infectious Disease

Subtopic: Osteomyelitis

Which scenario best depicts an indication when a CT-guided percutaneous needle biopsy should be done for vertebral osteomyelitis?

A. MRI of the spine reveals enhancement in an area with inflammation; also blood cultures are negative

B. MRI of the spine reveals enhancement in an area with inflammation; also blood cultures are positive

C. Before an MRI of the spine when you suspect osteomyelitis

D. The patient with no fever and straight leg test that is positive on the right side with some tingling in the right leg

E. MRI of the spine that reveals enhancement in an area with inflammation; blood culture is not drawn

Answer #28

Topic: Infectious Disease

Subtopic: Osteomyelitis

Correct Answer: Choice A (MRI of the spine reveals enhancement in an area with inflammation; also blood cultures are negative)

Patients who have vertebral osteomyelitis (bone infection in the spinal region) usually develop it from hematogenous spread. The usual presentation is fever and back pain with tenderness on exam. An MRI of the spine is the most sensitive and specific test to look for vertebral osteomyelitis. It will show enhancement and edema in a particular area of the spine. The causative agent is generally Staphylococcus aureus.

If you suspect vertebral osteomyelitis and blood cultures are negative, you should proceed with CT-guided percutaneous biopsy. This makes Choice A (MRI reveals enhancement in an area with inflammation and negative blood cultures) the correct answer.

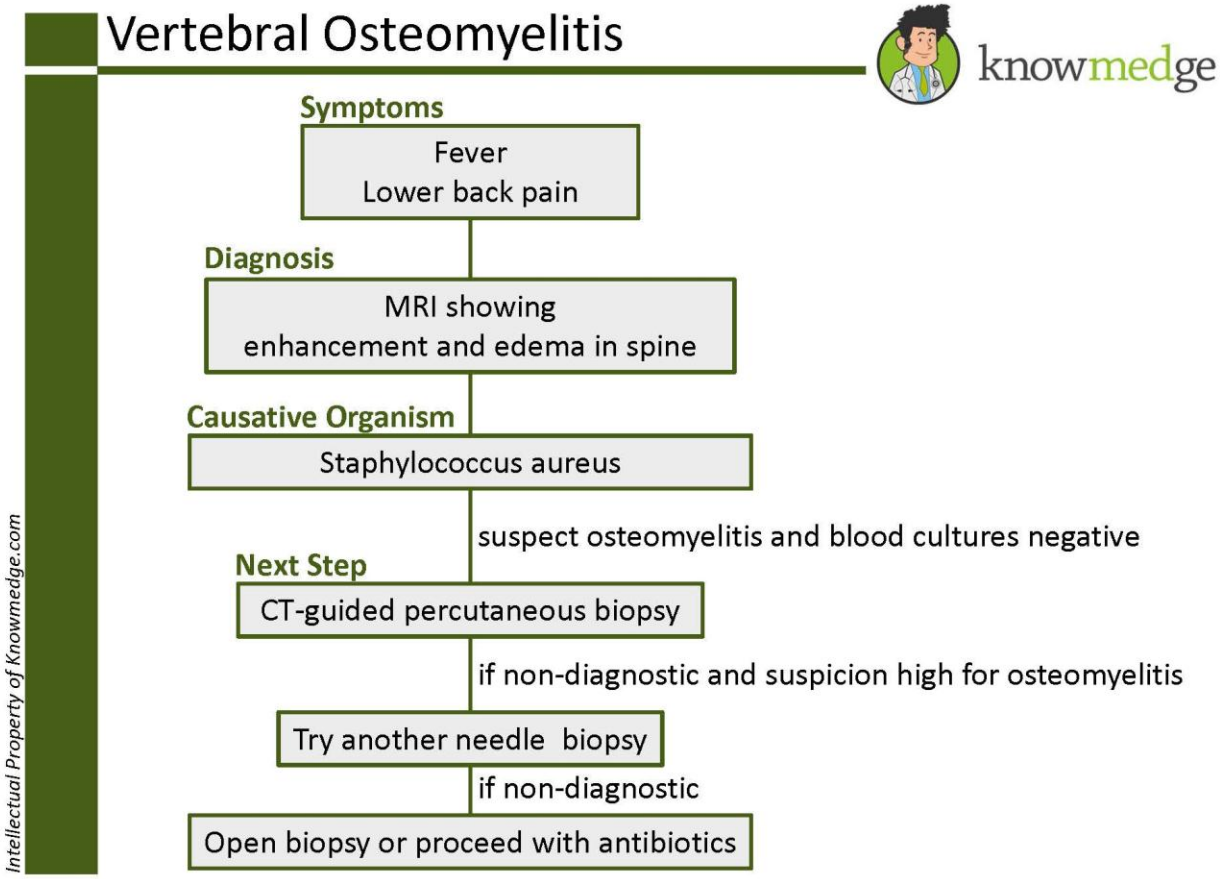
If the initial CT-guided percutaneous needle biopsy is non-diagnostic and your suspicion is high for vertebral osteomyelitis, you should get another needle biopsy. If this comes back non-diagnostic, you should either do open biopsy or proceed with antibiotics.

Let's review the other choices:

- **Choice B** (MRI reveals enhancement in an area with inflammation and positive blood cultures) does not require a needle biopsy since the blood cultures are positive and treatment can be initiated.
- **Choice C** (Before an MRI, when you suspect osteomyelitis) is incorrect because an MRI should be done before an invasive procedure like CT-guided needle biopsy.
- **Choice D** (Patient with no fever and positive straight leg test on the right side) is describing lumbar radiculopathy and does not require a CT-guided needle biopsy.
- **Choice E** (MRI that reveals enhancement in an area with inflammation; blood culture is not drawn) is incorrect because you should obtain blood cultures, a non-invasive study, prior to performing a CT-guided percutaneous needle biopsy.

Topic: Infectious Disease

Subtopic: Osteomyelitis



Question #29

Topic: Infectious Disease

Subtopic: UTIs

Which of the following is the most common causative organism of urinary tract infection in a young, sexually active woman?

A. Pseudomonas

B. Escherichia coli

C. Klebsiella

D. Proteus

E. Staphylococcus saprophyticus

Answer #29

Topic: Infectious Disease

Subtopic: UTIs

Correct Answer: Choice E (Staphylococcus saprophyticus)

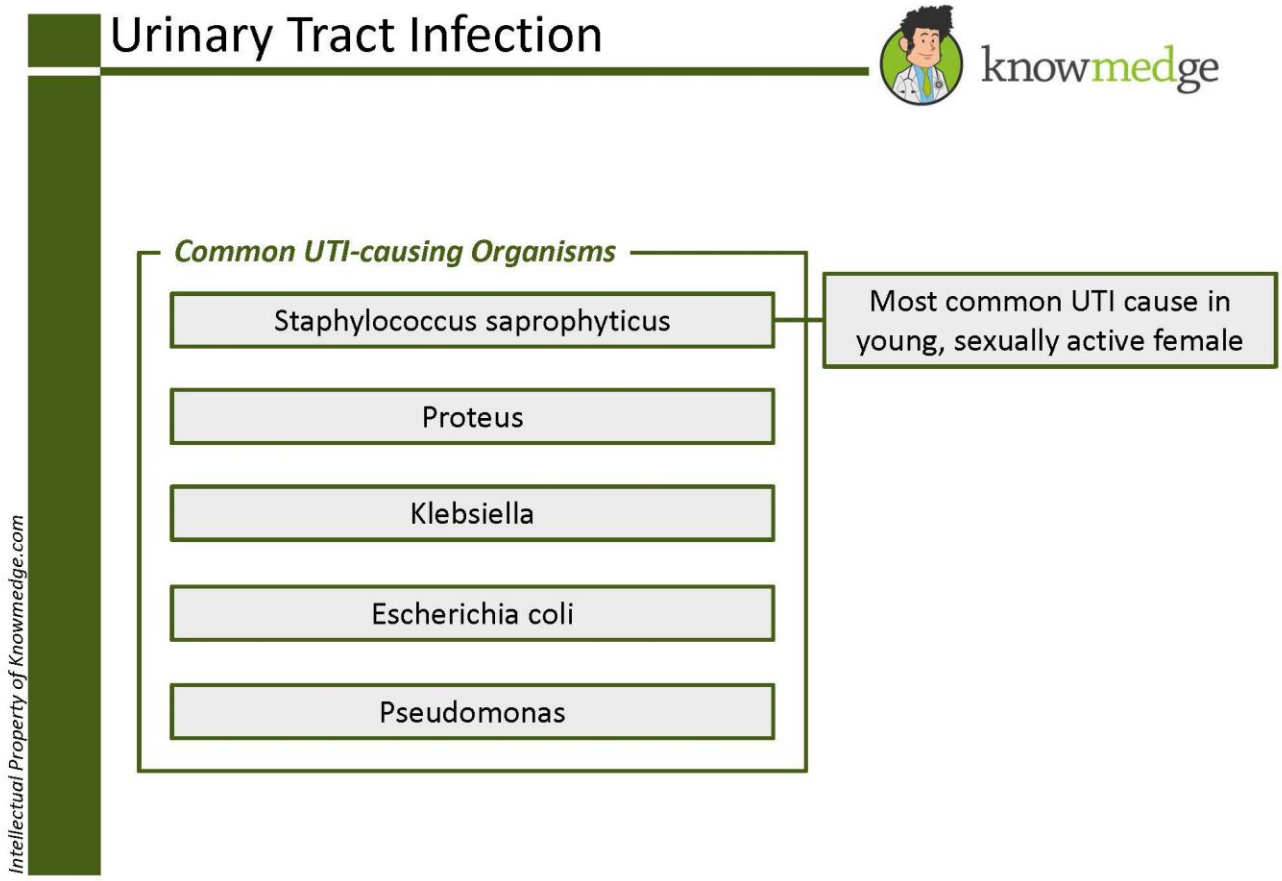
The mnemonic "SEEKS PP" helps remember the most common causes of urinary tract infections (UTI).

- S – Serratia
- E - E. coli
- E – Enterobacter
- K – Klebsiella
- S - Staphylococcus saprophyticus
- P – Pseudomonas
- P - Proteus mirabilis

As just described, **Choices A** (Pseudomonas), **B** (E. coli), **C** (Klebsiella) and **D** (Proteus) are all common causes of UTIs, but the MOST common cause of UTI in young, sexually active woman is **Choice E** (Staphylococcus saprophyticus).

Topic: Infectious Disease

Subtopic: UTIs



Chapter 7

Nephrology/Urology

Question #30

Topic: Nephrology/Urology

Subtopic: Acute Renal Failure

30-year-old female presents with a feeling of sand in her eyes and xerostomia. You order anti-SSA(Ro) and anti-SSB(La) tests and both come back positive. You discuss this with the patient and also tell her that she is at an increased risk of renal tubular acidosis (RTA). What can you expect with this type of RTA?

A. Defect in acid excretion in distal tubule, urine pH greater than 5.5, positive urine anion gap, low potassium

B. Defect in acid excretion in distal tubule, urine pH less than 5.5, positive urine anion gap, low potassium

C. Defect in acid excretion in distal tubule, urine pH greater than 5.5, negative urine anion gap, low potassium

D. Defect in acid excretion in distal tubule, urine pH less than 5.5, negative urine anion gap, low potassium

E. Defect in bicarbonate reabsorption in proximal tubule, initially urine pH greater than 5.5 and later less than 5.5, positive urine anion gap, low potassium

Answer #30

Topic: Nephrology/Urology

Subtopic: Acute Renal Failure

Correct Answer: Choice A (Defect in acid excretion in distal tubule, urine pH greater than 5.5, positive urine anion gap, low potassium)

Renal tubular acidosis can be classified into four types. The numbering can be confusing but if we focus on the basics, we can remember the concepts most frequently tested on the board exam.

- In **RTA I**, a distal tubule defect prevents acid from being secreted. As the acid remains in the body, the urine pH will usually rise to a level greater than 5.5. The affected proton secretion channel is also responsible for potassium uptake from the urine. Therefore, the serum potassium will be low and a positive urine anion gap will be present. RTA I-associated conditions include: Sjogren's syndrome (the above patient's diagnosis), nephrolithiasis and urinary obstruction.

- **RTA II** is caused by a defect in bicarbonate reabsorption in the proximal convoluted tubule. This will initially lead to urine pH level greater than 5.5 because bicarbonate is present in the urine but later some of the bicarbonate gets reabsorbed in the distal convoluted tubule. At that time, urine pH would likely be reduced to 5.5. Other lab findings include: hypokalemia and positive urine anion gap. Conditions that RTA II is associated with include: SLE, multiple myeloma, acetazolamide (carbonic anhydrase inhibitor) use and Fanconi syndrome.

- For an unknown reason, **RTA III** does not exist.

- **RTA IV** is caused by either hypoaldosteronism or a resistance to aldosterone effects. It is the only one of the RTAs that is associated with hyperkalemia. Other lab findings include a urine pH less than 5.5 and a positive urine anion gap. Medications which can cause hypoaldosteronism include eplerenone, spironolactone, and trimethoprim.

Key points to remember:

- All RTAs have positive urine anion gaps.

- Only RTA IV is associated with hyperkalemia.
- Only RTA I will have urine pH of greater than 5.5 throughout.
- You can use a simple mnemonic to remember the distinction between the types. People who want to be number "1" or "first" will always want to be greater than everyone else so pH is greater than 5.5. The same holds true for RTA II "i"nitially.

Since all RTAs have positive urine anion gaps, **Choice C** and **Choice D** can be eliminated.

- **Choice E** (Defect in proximal bicarbonate reabsorption, initially urine pH greater than 5.5 and later ph less than 5.5, positive UAG, low potassium) correlates with RTA II.
- **Choice A** (Defect in acid excretion in distal tubule, urine pH greater than 5.5, positive urine anion gap, low potassium) correctly illustrates the lab findings seen in Sjogren's syndrome-caused RTA I.

Topic: Nephrology/Urology

Subtopic: Acute Renal Failure

Renal Tubular Acidosis

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Type	Mechanism	Lab Findings	Associated Conditions
RTA I	Distal hydrogen ion secretion defect	Urine pH>5.5 Hypokalemia + Urine anion gap	Sjogren's syndrome Nephrolithiasis Urinary obstruction
RTA II	Proximal convoluted tubule defect in bicarbonate reabsorption	Urine pH>5.5 initially Urine pH<5.5 later Hypokalemia + Urine anion gap	SLE Multiple myeloma Acetazolamide Fanconi syndrome
RTA III	For unknown reason, RTA III does not exist		
RTA IV	Aldosterone deficiency or resistance to aldosterone effects	Hyperkalemia Urine pH<5.5 + Urine anion gap	Eplerenone Spironolactone Trimethoprim

All RTAs have positive Urine Anion Gap
Only RTA IV has Hyperkalemia
Only RTA I (and RTA II initially) has Urine pH>5.5

Question #31

Topic: Nephrology/Urology
Subtopic: Chronic Kidney Disease

58-year-old male with a history of chronic kidney disease presents to the ED for altered mental status and asterixis. Labs indicate low bicarbonate level, increased potassium of 6.0mEq/L, low albumin level and creatinine of 4.8mg/dL, which has been the patient's baseline. The patient's GFR is calculated at 20ml/min. He undergoes a chest xray that shows massive pleural effusions bilaterally. The patient's EKG shows diffuse ST-elevation and depression of PR-intervals. All of the following are indications for hemodialysis except:

A. Altered mental status and asterixis
B. GFR of 20ml/min
C. Diffuse ST elevation and depression of PR intervals
D. Low albumin level
E. Pleural effusions bilaterally

Answer #31

Topic: Nephrology/Urology

Subtopic: Chronic Kidney Disease

Correct Answer: Choice B (GFR of 20ml/min)

Indications of hemodialysis can be remembered by the mnemonic A E I O U and G.

- A – Acidosis
- E - Electrolyte abnormalities, most specifically very high potassium
- I - Insufficient oral intake of food or fluids leading to hypoalbuminemia
- O - Overload of fluids
- U - Uremic encephalopathy or uremic pericarditis
- G - GFR less than 15ml/min

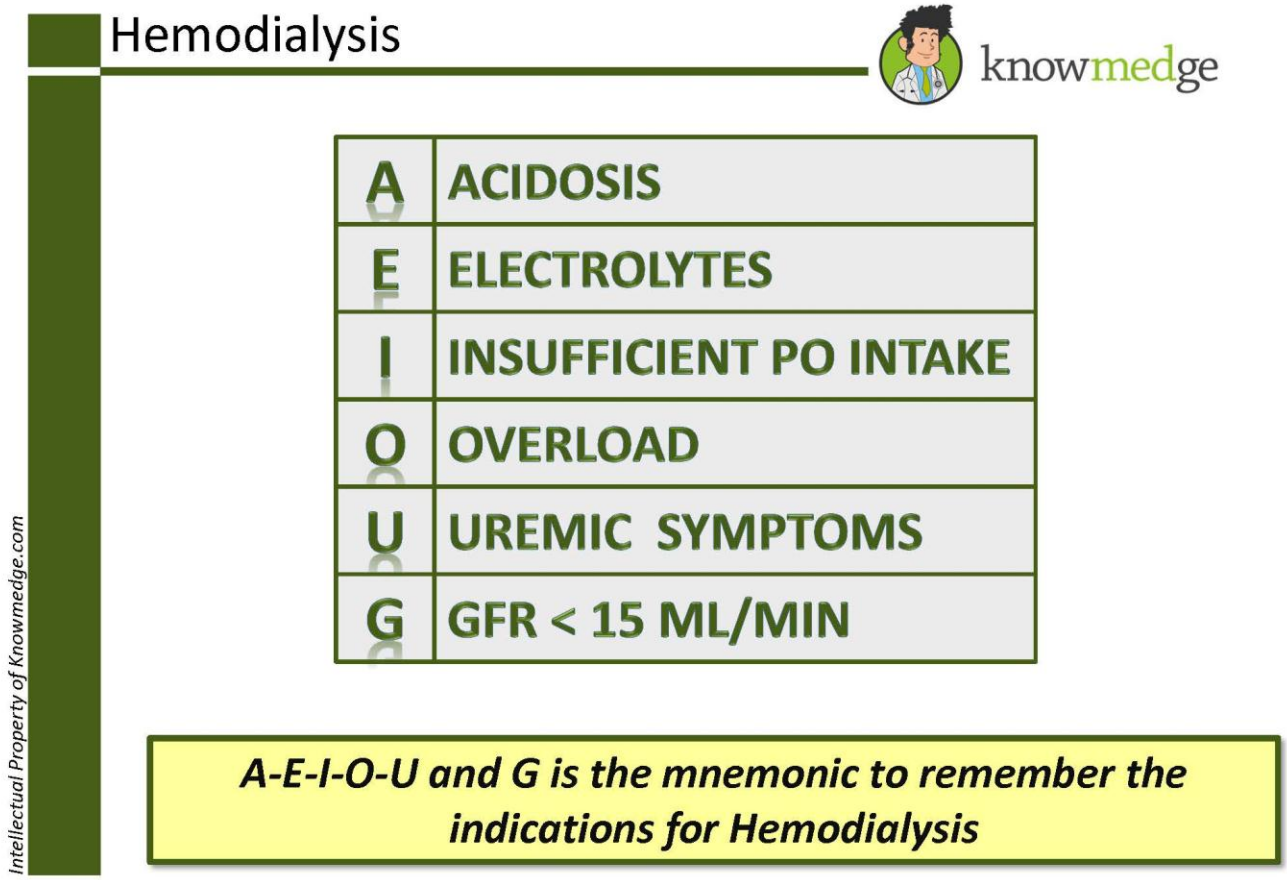
Choice A (Altered mental status and asterixis), which is an example of uremic symptoms, requires hemodialysis.

Choice C (Diffuse ST elevation and depressed PR intervals) is consistent with EKG findings related to fluid overload, another indication for hemodialysis. The patient's bicarbonate level is low, albumin is low (**Choice D**), and potassium is high, which are electrolyte/lab abnormalities that are severe enough to meet criteria for hemodialysis.

Only **Choice B** (GFR 20ml/min) is not an indication for hemodialysis as GFR is greater than 15ml/min.

Topic: Nephrology/Urology

Subtopic: Chronic Kidney Disease



Question #32

Topic: Nephrology/Urology
Subtopic: Urinary Incontinence

68-year-old male nursing home resident presents to your office for a follow-up visit. The patient has history of hypertension, dyslipidemia, and iron deficiency anemia. His current medications include amlodipine, simvastatin and ferrous sulfate. The patient says that he has been doing well but feels very depressed because his brother just passed away. He denies suicidal thoughts at this time but says that he has a lack of interest in hobbies for which he was previously enthusiastic. He also has decreased energy level, decreased appetite, decreased concentration and is experiencing hypersomnia. You decide to start the patient on amitriptyline. A few weeks later, the nursing home nurse says that his depression is better but starts to smell of urine. Which of the following explains the incontinence and mechanism of incontinence in this patient?

A. Urge incontinence from decreased detrusor activity
B. Overflow incontinence from decreased detrusor activity
C. Overflow incontinence from prostate hyperplasia
D. Stress incontinence from decreased sphincter tone
E. Urge incontinence from increased detrusor activity

Answer #32

Topic: Nephrology/Urology

Subtopic: Urinary Incontinence

Correct Answer: Choice B (Overflow incontinence from decreased detrusor activity)

Incontinence can be broken down into urge, stress, and overflow.

- **Urge incontinence** is having the "urge" to urinate but without achieving full evacuation of the bladder which leads to leakage. This is due to detrusor over-activity and the mainstay of treatment is either anti-cholinergics or tricyclic antidepressants.

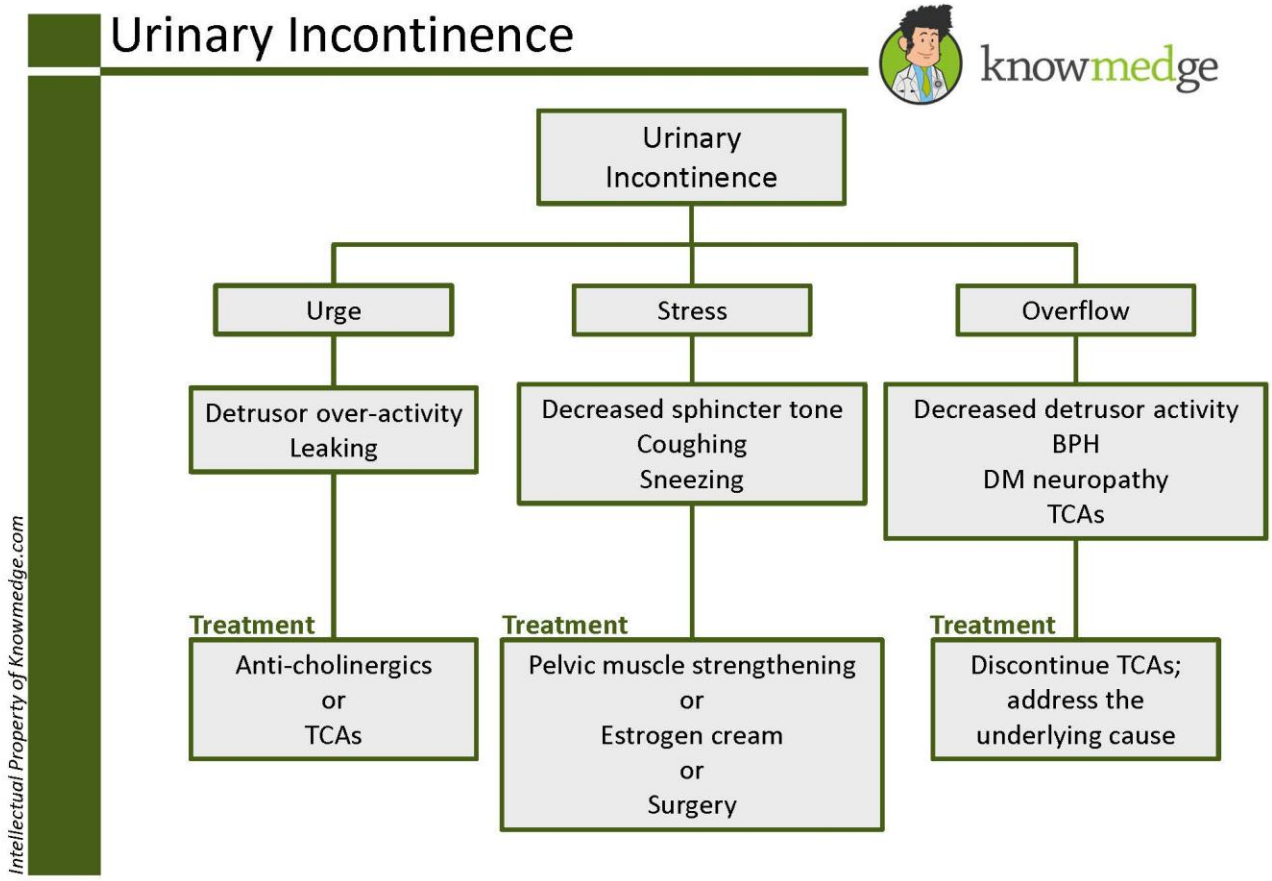
- **Stress incontinence** is a result of decreased sphincter tone; coughing and sneezing can cause individual to urinate. Treatment for this is strengthening the pelvic muscles through Kegel exercises or estrogen cream or surgery.

- **Overflow incontinence** can be from urinary obstruction from conditions such as BPH or from decreased detrusor activity. Decreased detrusor activity can occur from diabetic neuropathy or neurological conditions.

This patient starts to have incontinence after being started on amitriptyline. This is a medication that is in the class of medications called tricyclic antidepressants (TCAs). TCAs have anti-cholinergic effects as well. As a result, the patient has decreased detrusor activity that is causing him to have overflow incontinence. This makes **Choice B** (Overflow incontinence from decreased detrusor activity) the correct answer. Treatment for overflow incontinence is to address the underlying cause. As diabetic neuropathy or BPH may be involved, treatment will entail addressing these conditions. If the patient is on a TCA, this medication should be discontinued.

Topic: Nephrology/Urology

Subtopic: Urinary Incontinence



Question #33

Topic: Nephrology/Urology
Subtopic: Glomerular Disorders

50-year-old male comes in with left lower quadrant abdominal pain without fevers. The patient undergoes CT of the abdomen that shows some diverticulosis without diverticulitis. It is recommended that the patient follow a high fiber diet to prevent diverticulitis. CT scan also reveals "bumpy" contours of the renal pelvis. All of the following are associated with this CT finding of the renal pelvis except:

A. Chronic alcohol abuse
B. NSAIDs
C. Diabetes mellitus
D. Hypertension
E. Sickle cell disease

Answer #33

Topic: Nephrology/Urology
Subtopic: Glomerular Disorders
Correct Answer: Choice D (Hypertension)

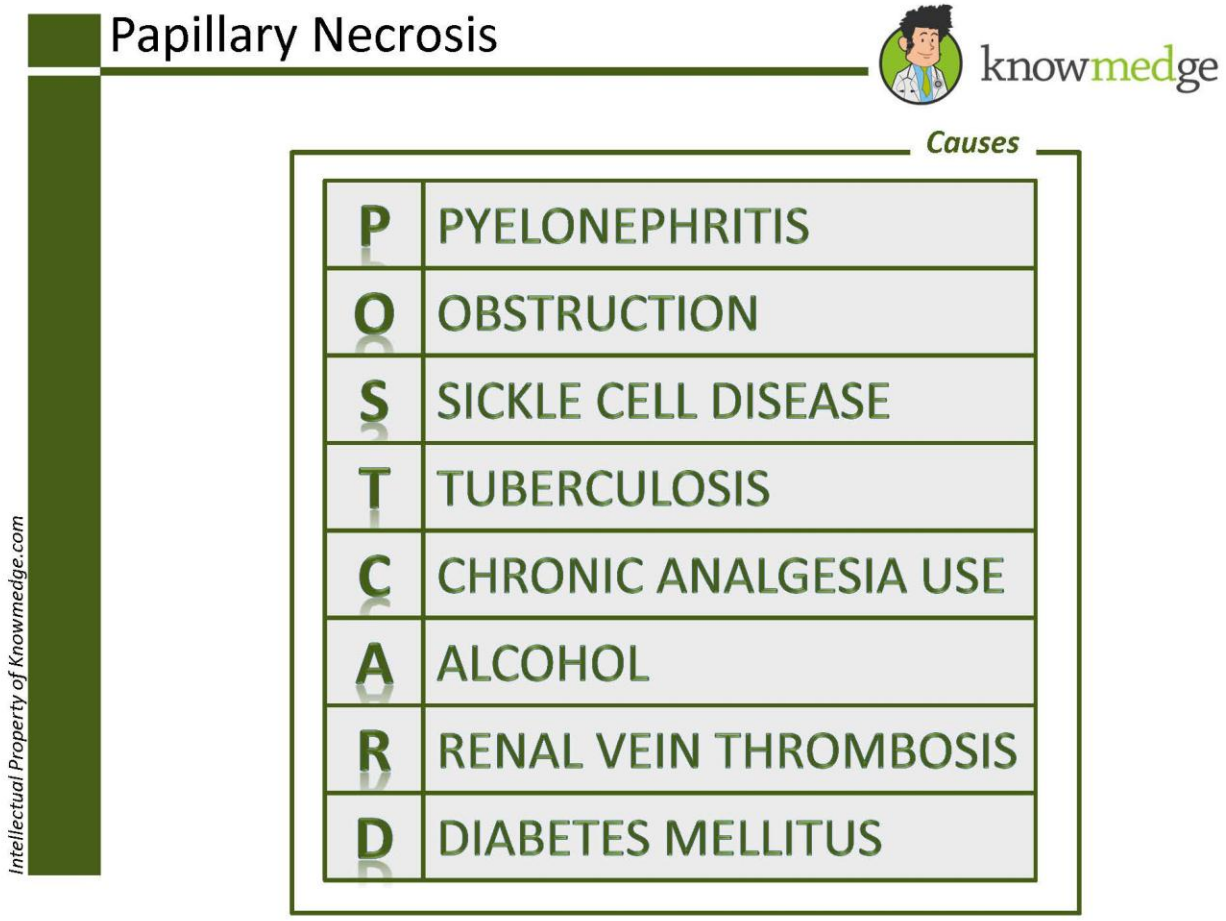
Bumpy contours of renal pelvis suggests papillary necrosis. Causes of papillary necrosis can be remembered by the mnemonic POSTCARD:

- P - Pyelonephritis
- O - Obstruction
- S - Sickle cell disease
- T - Tuberculosis
- C - Chronic analgesic use (NSAIDs)
- A - Alcohol
- R - Renal vein thrombosis
- D - Diabetes mellitus

From the above choices, only **Choice D** (Hypertension) will not cause papillary necrosis.

Topic: Nephrology/Urology

Subtopic: Glomerular Disorders



Question #34

Topic: Nephrology/Urology
Subtopic: Nephrolithiasis

55-year-old male presents with left flank tenderness and pain that radiates to the groin. Urinalysis reveals blood with many red blood cells but is negative for signs of infection. He undergoes a CT of the abdomen without contrast that reveals a 4mm sized non-obstructive kidney stone. He is given IV fluids and IV ketorolac which improves his pain. All of the following conditions can predispose to the development of nephrolithiasis (kidney stones) except:

A. Crohn's disease
B. High sodium diet
C. Short bowel syndrome
D. Sarcoidosis
E. Hypercitraturia

Answer #34

Topic: Nephrology/Urology

Subtopic: Nephrolithiasis

Correct Answer: Choice E (Hypercitraturia)

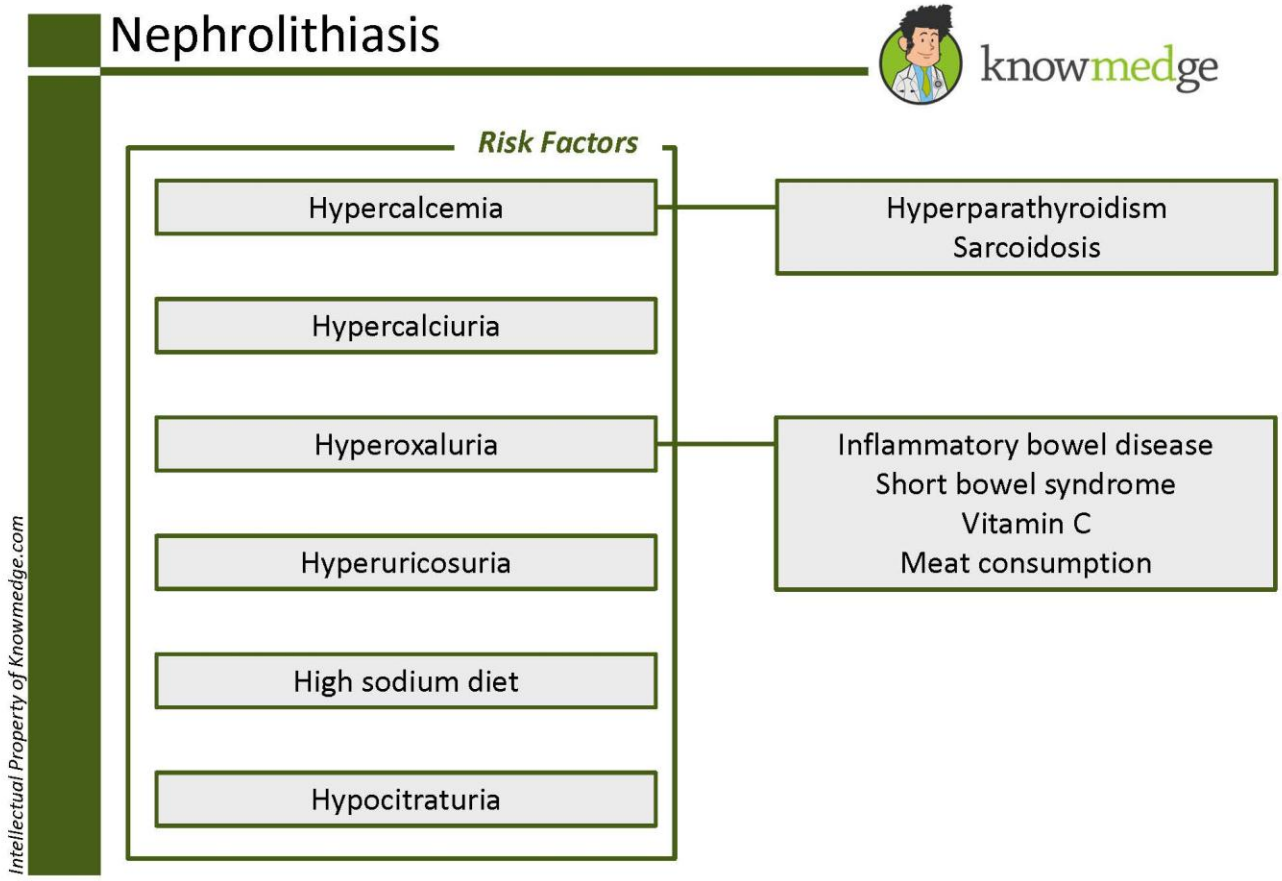
Nephrolithiasis, known as kidney stones, is a common disease characterized by the formation of crystalline aggregates anywhere along the urinary tract. Risk factors for kidney stones include:

- **Age:** Most common in adults over 40
- **Gender:** More prevalent among males
- **Family history:** If someone in your family had kidney stones, you are more likely to get it. Also, if you've previously had it, you are at an increased risk of getting it again.
- **Diet:** High sodium, protein, and sugar diets may increase your risk of some type of kidney stones.
- **Lifestyle:** Patients with a high BMI are more likely to suffer from kidney stones.
- **Medical conditions / diseases:** Conditions / diseases such as renal tubular acidosis, cystinuria, hyperparathyroidism, inflammatory bowel disease, short bowel syndrome, Hypocitraturia (low amount of citrate in the urine), sarcoidosis, and Crohn's disease can increase your risk for developing kidney stones

The only risk condition listed that is not a risk factor for nephrolithiasis is **Choice E** (Hypercitraturia).

Topic: Nephrology/Urology

Subtopic: Nephrolithiasis



Chapter

8

Oncology

Question #35

Topic: Oncology
Subtopic: GI or Hepatic Cancer

54-year-old male undergoes a screening colonoscopy which shows a colonic mass in the cecum. Biopsy of the mass confirms that he has adenocarcinoma of the colon that invades the submucosa. He also undergoes lymph node dissection which shows no lymph nodes being involved. CT of the abdomen and pelvis don't show any metastasis to the liver. After the patient undergoes hemicolectomy, what else is required for this patient?

A. Observation
B. Chemotherapy with FOLFOX
C. Chemotherapy with FOLFOX and radiation therapy
D. Radiation therapy alone
E. Irinotecan only

Answer #35

Topic: Oncology
Subtopic: GI or Hepatic Cancer
Correct Answer: Choice A (Observation)

Stages of colon cancer are as follows:

- T1: submucosa/mucosa; T2: muscularis propria; T3: serosa; T4: invades nearby structures.
- N0: no lymph node involvement; N1: 1-3 lymph node involvement; N2: 4 or more lymph node involvement.
- M0: no distant metastasis; M1: distant metastasis.

This patient, having adenocarcinoma invading the submucosa, with no lymph node or metastases, would be classified as having colon cancer with T1N0M0 staging. After hemicolectomy, chemotherapy is required for the following conditions:

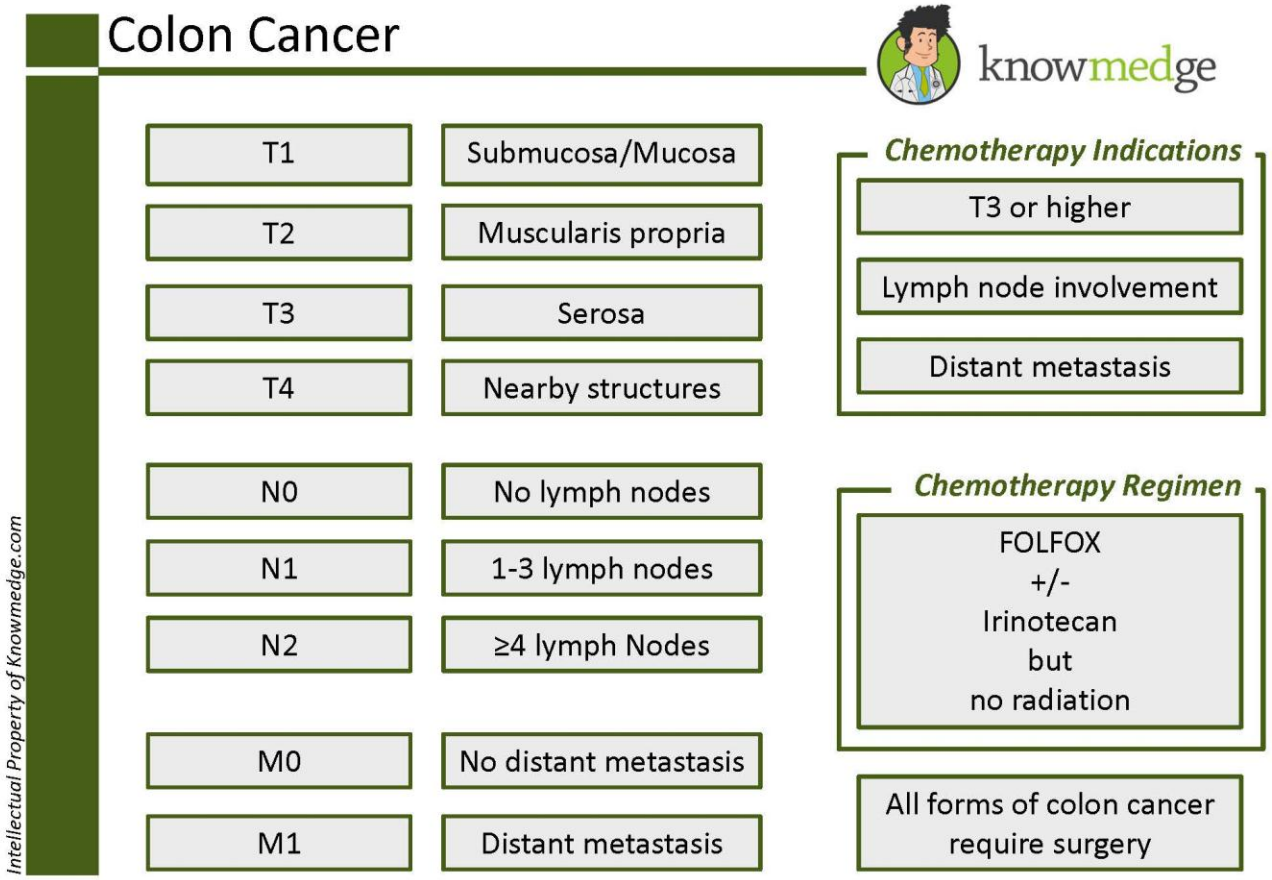
- T3 or higher
- Lymph node involvement
- Distant metastasis

Chemotherapy for colon cancer is usually in the form of FOLFOX (FOLinic acid, Flurouracil, and OXaliplatin). In addition to FOLFOX, another agent that can be used is called irinotecan. An important side effect associated with irinotecan is diarrhea.

Choice D (Radiation therapy) is used for rectal cancer but never for colon cancer. Colon cancer will generally first metastasizes to the liver. Since this patient is T1NOM0, after surgery (which is recommended for any colon cancer), **Choice A** (Observation) is the most appropriate answer. Carcinoembryonic antigen (CEA) levels should be checked every 3-6 months for the first two years and then every six months for the next three years.

Topic: Oncology

Subtopic: GI or Hepatic Cancer



Question #36

Topic: Oncology
Subtopic: Neoplasms of Head and Neck

55-year-old male presents with fever, night sweats and weight loss for about three months. The patient has an enlarged cervical lymph node for which he undergoes biopsy. It is consistent with lymphoma. With which of the following lymphomas can you take a watch-and-wait approach to treatment?

A. Mantle cell lymphoma
B. Hodgkin's lymphoma
C. Diffuse large cell lymphoma
D. Burkett's lymphoma
E. Follicular lymphoma

Answer #36

Topic: Oncology

Subtopic: Neoplasms of Head and Neck

Correct Answer: Choice E (Follicular lymphoma)

Lymphomas are broken down into Hodgkin's lymphoma and Non-Hodgkin's lymphoma(NHL). Of the NHLs, 85% are B-cell origin and 15% are T-cell origin. B-cell origin NHLs all contain markers CD19 and CD20.

B-cell origin lymphomas can be further broken down into aggressive, highly aggressive, and indolent lymphomas.

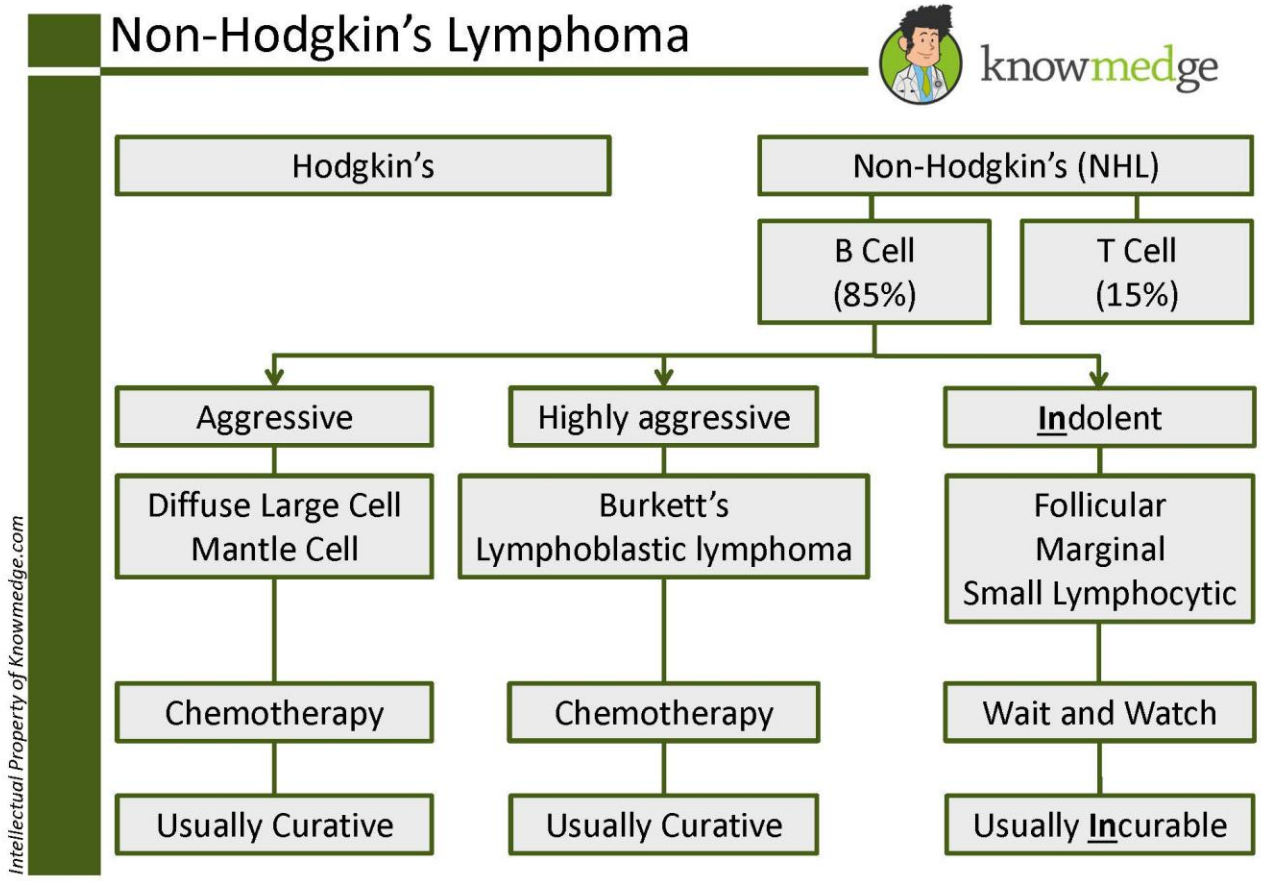
- **Aggressive:** These include diffuse large cell and mantle cell lymphomas. These lymphomas can be treated with chemotherapy and can usually be cured because they are likely to have extra-nodal involvement.

- **Highly aggressive:** Highly aggressive lymphomas include Burkett's and lymphoblastic lymphoma. Similar to aggressive lymphomas, highly aggressive lymphomas can be treated with chemotherapy and can usually be cured because they are likely to have extra-nodal involvement.

- **Indolent:** Indolent lymphomas are usually incurable except if confined to one lymph node chain at which time radiation therapy is the mainstay of treatment. Indolent lymphomas are the ones that you can take a watch-and-wait approach and treat if symptoms are worsening or if multiple organs are involved. The most common indolent lymphoma is **Choice E** (Follicular lymphoma). Other indolent lymphomas are mucosa-associated lymphoid tissue (MALT), marginal, and small lymphocytic. Unlike the others, MALT can be caused by Helicobacter pylori and can be treated with amoxicillin, clarithromycin and a proton-pump inhibitor, which eradicates the H. pylori organism.

Topic: Oncology

Subtopic: Neoplasms of Head and Neck



Question #37

Topic: Oncology
Subtopic: Lung Cancer

56-year-old male with a long standing history of smoking presents with cough, worsening shortness of breath, hemoptysis and weight loss. He undergoes a chest xray and CT of the chest that shows a mass in the right lung. Lung biopsy reveals the type of lung cancer associated with paraneoplastic syndromes such as SIADH, Cushing syndrome from ectopic production of ACTH, carcinoid syndrome and Eaton-Lambert syndrome.

The patient is cachectic and has extensive disease spread to the brain as indicated by a recent MRI of the head. He reports having "hardly any energy" and is unable to perform his activities of daily living. He lies in bed the whole day and rarely eats any food. Based on what type of cancer this patient has, which of the following is the most appropriate next step at this time for the patient?

A. Hospice care
B. Surgery and chemotherapy
C. Surgery, chemotherapy, radiation therapy to the brain
D. Chemotherapy and radiation therapy to the brain
E. Chemotherapy and radiation therapy to the lungs and brain

Answer #37

Topic: Oncology

Subtopic: Lung Cancer

Correct Answer: Choice D (Chemotherapy and radiation therapy to the brain)

Lung cancer is categorized as small cell lung cancer and non-small cell lung cancer.

The clues to identifying the patient's lung cancer are the accompanying paraneoplastic syndromes. SIADH, Cushing syndrome from ectopic production of ACTH, carcinoid syndrome, and Eaton Lambert syndrome are most commonly associated with small cell lung cancer. Small cell lung cancer is aggressive and can metastasize quickly. Once metastasis occurs, surgery is not recommended as a treatment option for the patient. This eliminates **Choice B** (Surgery and chemotherapy) and **Choice C** (Surgery, chemotherapy, radiation therapy to the brain).

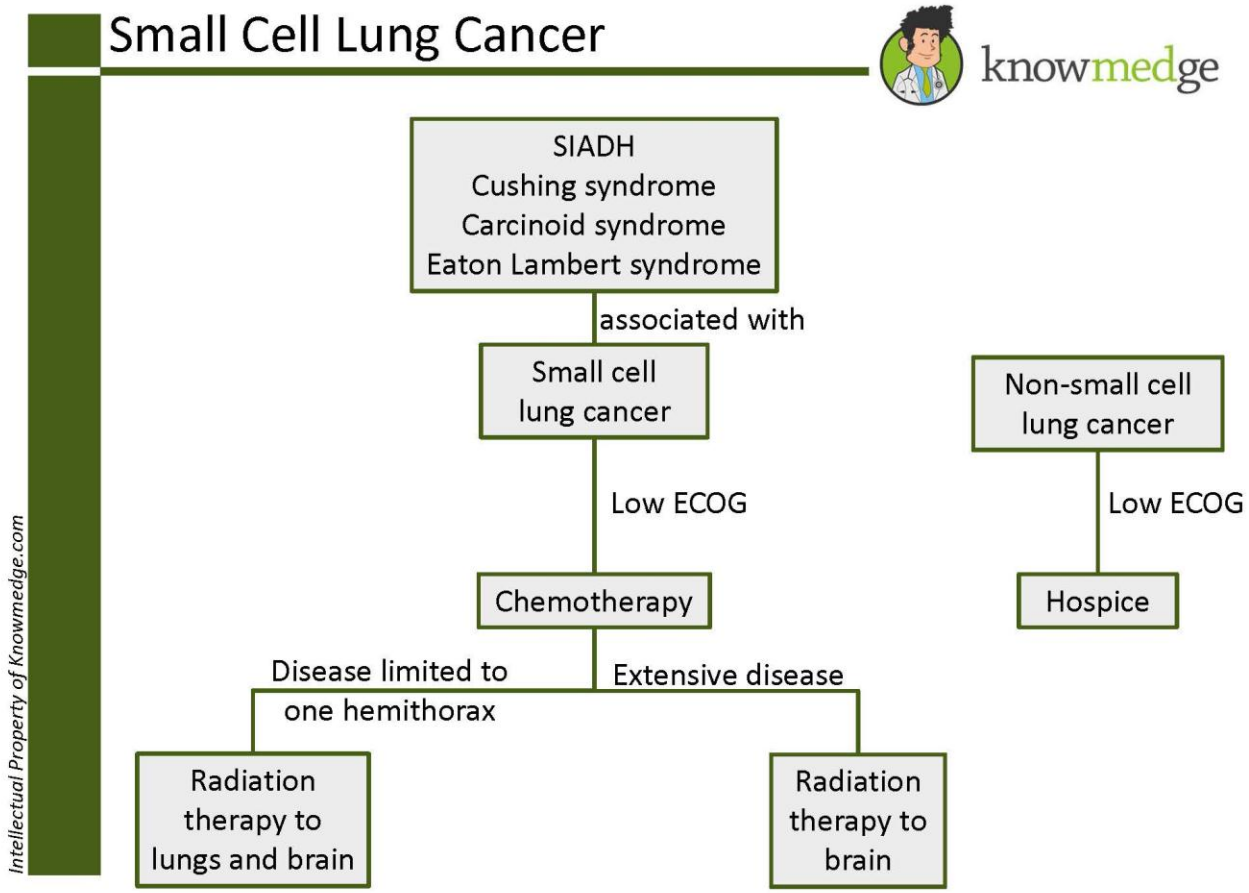
Unlike non-small cell lung cancer, when patients with small cell lung cancer have a very poor Eastern Cooperative Oncology Group (ECOG) performance score, chemotherapy is recommended. If the patient had non-small cell lung cancer (e.g. adenocarcinoma, squamous cell carcinoma, or large cell carcinoma) and presented with this scenario, then **Choice A** (Hospice care) would have been correct. Since he has small cell cancer, he doesn't need hospice care at this time. Chemotherapy can help the patient improve his overall function.

If the patient had disease limited to one hemithorax, then **Choice E** (Chemotherapy and radiation therapy to the lungs and brain) would be the correct answer.

Since he has extensive disease with brain metastasis, the best next step is **Choice D** (Chemotherapy and radiation therapy to the brain).

Topic: Oncology

Subtopic: Lung Cancer



Chapter

9

Neurology

Question #38

Topic: Neurology

Patient has a three second spike and wave pattern seen on electroencephalography (EEG). Which of the following is true of this type of seizure?

A. It is an example of simple partial seizure
B. It is an example of complex partial seizure
C. It is associated with post-ictal symptoms
D. It is an example of a generalized seizure
E. It can be treated with the same medication used for multiple sclerosis spasticity and trigeminal neuralgia

Answer #38

Topic: Neurology
Correct Answer: Choice D (It is an example of a generalized seizure)

Having a 3-second spike and wave pattern on an EEG is pathognomonic for absence seizures which are also known as petit-mal seizures. Seizures can be broken down into generalized and partial.

- Generalized seizures involve both cerebral hemispheres. Generalized seizures include tonic-clonic and absence seizures.

- Partial seizures, on the other hand, involves only one hemisphere. They also have the tendency to progress to generalized seizures. Partial seizures are broken down even more into simple and complex. In simple partial seizures, consciousness is not compromised. Alternatively, complex partial seizures have impaired consciousness.

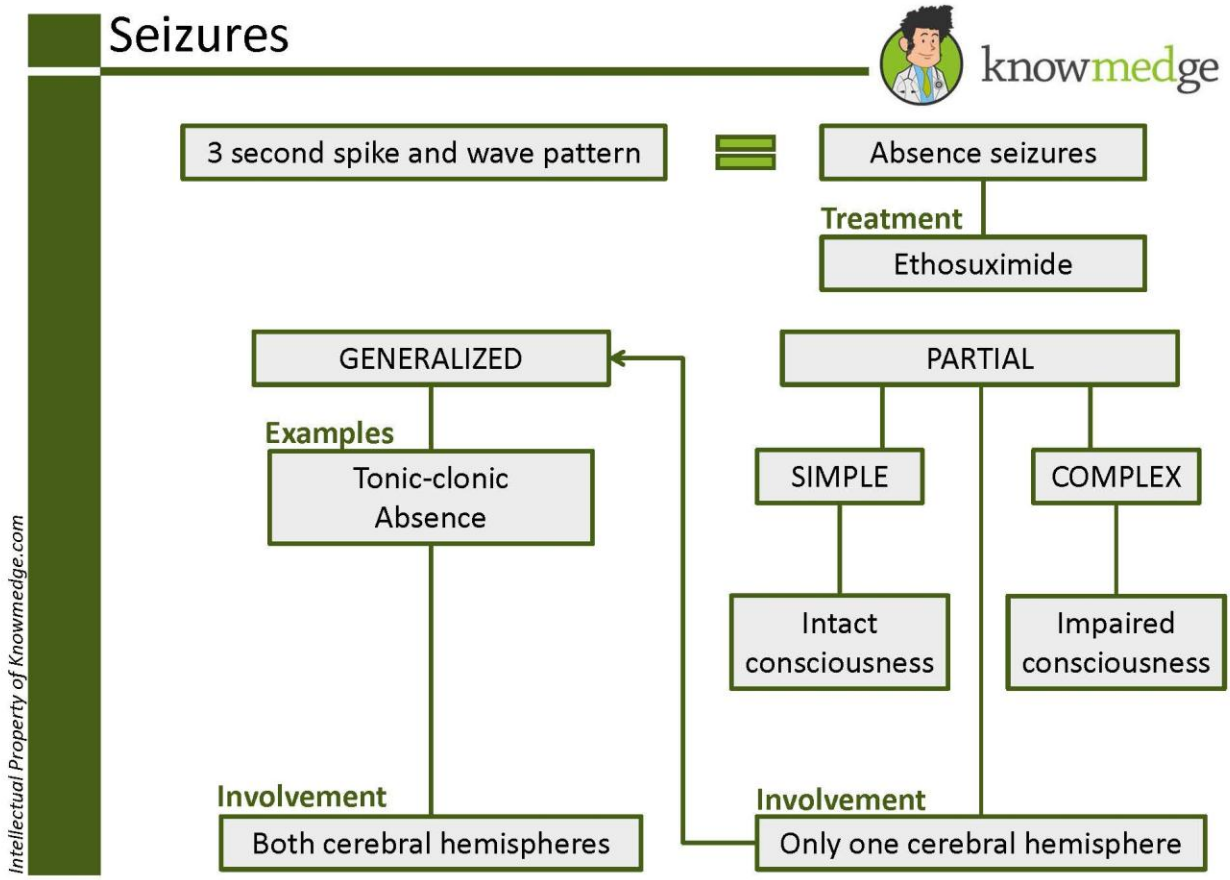
Let's go through the answer choices:

- **Choices A** (Simple partial seizure) and **B** (Complex partial seizure) are incorrect because absence seizures are an example of generalized seizure.

- **Choice C** (Associated with post-ictal symptoms) is incorrect because absence seizures are not associated with a sense of aura or post-ictal symptoms.

- **Choice E** (Treatment with the same medication used for multiple sclerosis spasticity and trigeminal neuralgia) is describing the medication carbamazepine and is not used for absence seizures. There are a few anti-seizure medications that can be used for absence seizures but the main one to know is ethosuximide.

Topic: Neurology



Question #39

Topic: Neurology

Which of the following scenarios will present with hyporeflexia?

A. Patient with decreased free T4 and increased TSH level

B. Patient with ascending paralysis after upper respiratory infection or C. jejuni infection

C. Patient bitten by a mosquito during the humid summer months now presents with meningitis symptoms and rash

D. Patient who develops neurological symptoms with increased mean corpuscular volume (MCV), increased methylmalonic acid and increased homocysteine levels

E. Patient who develops neurological symptoms because of demyelination of the brain and spinal cord and with lack of ipsilateral abduction to a contralateral gaze

Answer #39

Topic: Neurology

Correct Answer: Choice C (Patient bitten by a mosquito during the humid summer months now presents with meningitis symptoms and rash)

Reflexes can be classified into:

- Areflexia (Absent reflexes)
- Delayed reflexes
- Hyporeflexia (below normal or absent reflexes)
- Hyperreflexia (overactive or overresponsive reflexes)

Let's review the answer choices:

- **Choice A** (Decreased free T4 and increased TSH level) is describing an individual with primary hypothyroidism. These patients will have delayed reflexes.
- **Choice B** (Ascending paralysis after upper respiratory infection or C. jejuni infection) describes Guillain-Barre syndrome. In these patients, there will be absent reflexes.
- **Choice C** (Mosquito bite in summer months preceding meningitis and rash) is the correct answer and refers to the West Nile virus infection. This describes a scenario with hyporeflexia.
- **Choice D** (Neurological symptoms with increased MCV, increased methylmalonic acid and increased homocysteine levels) describes vitamin B12 deficiency that can cause subacute combined degeneration. These patients will have hyperreflexia.
- **Choice E** (Neurological symptoms because of demyelination of brain and spinal cord) describes an individual with multiple sclerosis, who will have hyperreflexia.

Topic: Neurology

Reflexes

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Reflexes

Absent	Delayed	Hyporeflexic	Hyperreflexic

Diagnosis	*Description*	*Reflexes*
Primary hypothyroidism	Decreased free T4, Increased TSH	Delayed
Guillain-Barre syndrome	Ascending paralysis after URI or C. jejuni infection	Absent
Vitamin B12 deficiency	Neurological symptoms with ↑ MCV, methylmalonic acid, homocysteine	Hyperreflexia
Multiple sclerosis	Neurological symptoms because of demyelination of brain/spinal cord	Hyperreflexia
West Nile virus	Mosquito bite in summer months preceding meningitis and rash	Hyporeflexia

Question #40

Topic: Neurology

68-year-old female presents with left leg dragging and weakness, a condition she has been experiencing for the past few days. The patient has a history of hypertension, diabetes mellitus and dyslipidemia. She takes lisinopril, metformin and simvastatin. The patient also says that for the past few days she has been having some problems controlling her urine and instability when walking. Latest labs show HgbA1c of 6.0%. Her comprehensive metabolic panel (CMP), complete blood count (CBC), and lipid panel test results are all within normal limits. Vital signs show blood pressure 175/100mmHg, pulse 76/min, respiratory rate 18/min, and the patient is afebrile. Physical exam is positive for left-sided leg weakness. Which of the following lesions does this person most likely have?

A. Left anterior cerebral artery lesion
B. Right anterior cerebral artery lesion
C. Left middle cerebral artery lesion
D. Right middle cerebral artery lesion
E. Right posterior cerebral artery lesion

Answer #40

Topic: Neurology

Correct Answer: Choice B (Right anterior cerebral artery lesion)

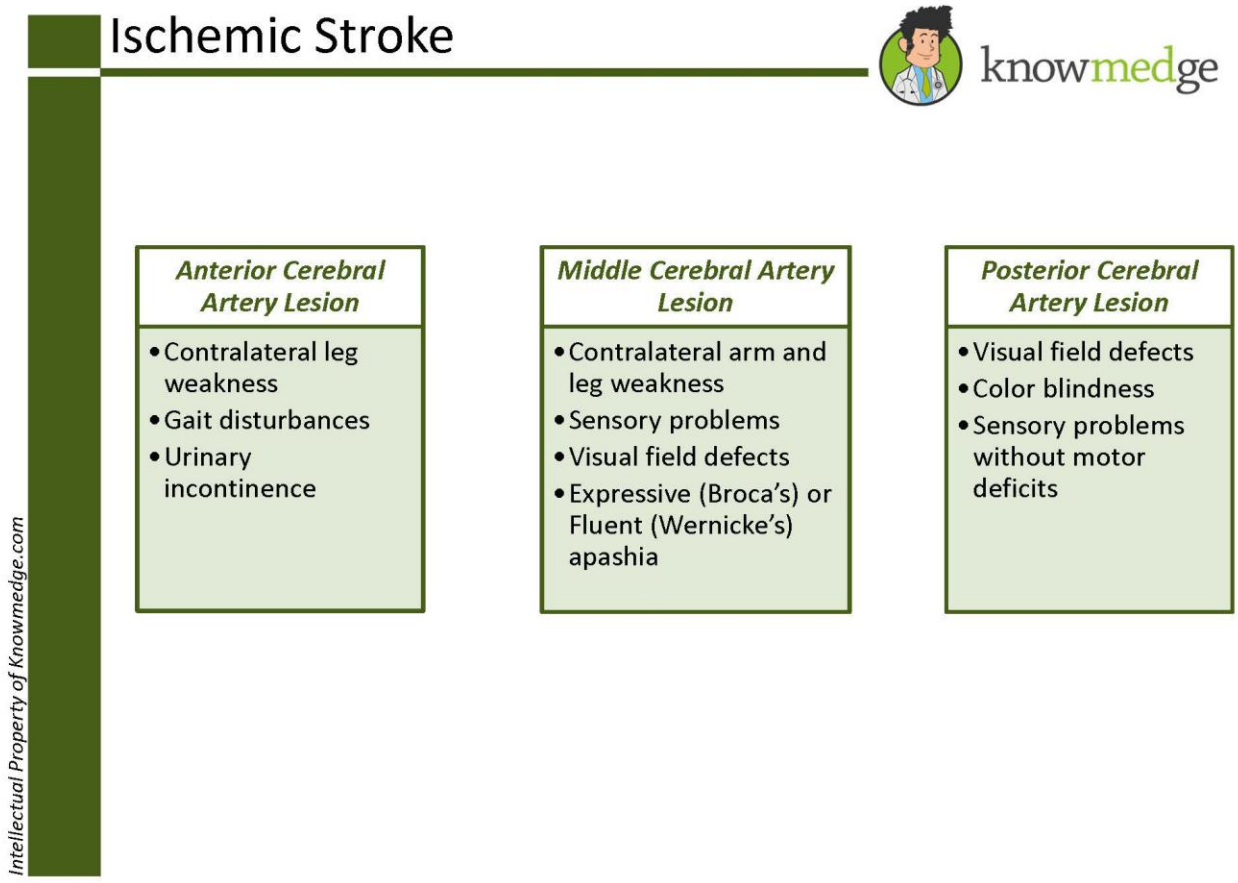
Localizing the lesion based on neurological findings in a patient who experiences a stroke is an important skill. While performing a thorough neurological exam can be difficult in real life, for the boards, simply remember certain patterns to arrive at the diagnosis.

- Patients with anterior cerebral artery lesions will show contralateral leg weakness, gait disturbances, and urinary incontinence. Since this patient has left leg weakness, the patient's lesion will be on **Choice B** (Right anterior cerebral artery).

- Patients with middle cerebral artery lesions will have contralateral arm and leg weakness and sensory problems. They can also present with visual field defects and expressive (Broaca's aphasia) or fluent aphasia (Wernicke's aphasia).

- Posterior cerebral artery lesions will cause visual field defects with color blindness and sensory problems without motor deficits.

Topic: Neurology



Chapter
10

Dermatology

Question #41

Topic: Dermatology

35-year-old female presents to the clinic for sore throat, odynophagia and fevers for 10 days. You perform rapid strep testing and obtain anti streptolysin O titers on her and treat her with antibiotics. A few weeks later, she says her strep throat is better but now she has purple bumps on her legs and buttocks area. She also reports a significant amount of abdominal pain with diarrhea. She says her elbows, knees and hips are also hurting. Based on what the patient likely has, which antibody would most likely be elevated in this condition?

A. Antibody associated with type I hypersensitivity reaction

B. Antibody that is the most often deficient in patients with recurrent infections

C. Core antibody of hepatitis B virus that is elevated in acute infection

D. Core antibody of hepatitis B virus that is elevated in chronic infection

E. No antibody is elevated

Answer #41

Topic: Dermatology

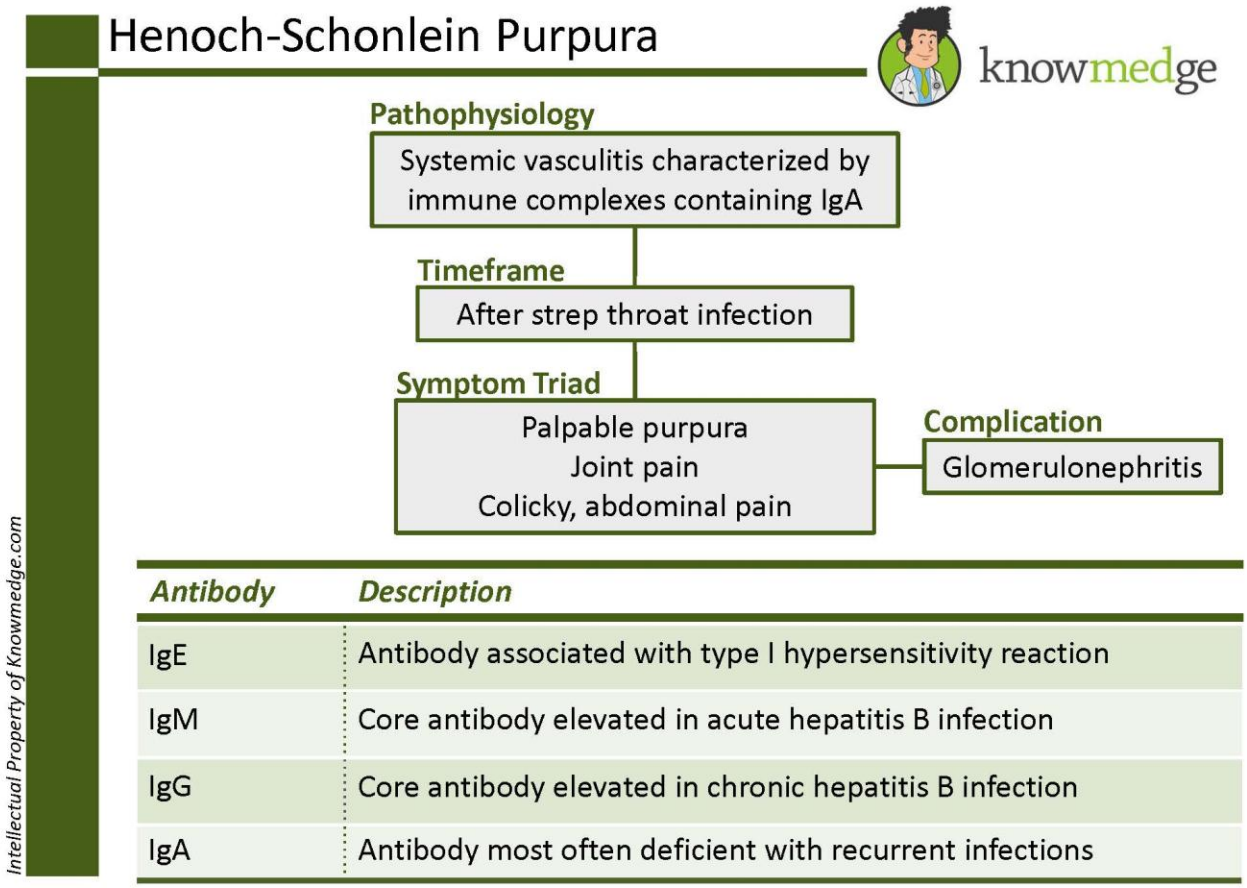
Correct Answer: Choice B (Antibody that is the most often deficient in patients with recurrent infections)

This patient likely has Henoch-Schonlein purpura (HSP), a systemic vasculiitis that is characterized by immune complexes containing IgA. This condition can be common after strep throat infections. Patients usually have the triad of palpable purpura (spots that start on the legs or buttocks area), joint pain, and abdominal pain. Some patients can also develop glomerulonephritis.

Now let's review the answer choices.

- **Choice A** (Antibody associated with type I hypersensitivity reaction) is describing IgE.
- **Choice B** (Antibody that is the most often deficient in patients with recurrent infections) is the correct answer. IgA deficiency is the most common antibody that can be deficient, causing recurrent infections.
- **Choice C** (Core antibody elevated in acute hepatitis B infection) is describing IgM.
- **Choice D** (Core antibody elevated in chronic hepatitis B infection) is describing IgG. In addition to chronic infections, hepatitis B carrier states will also have elevated IgG. Differentiating between the two can be done by looking at liver function tests (LFTs). With chronic hepatitis B, LFTs are elevated; whereas, in carrier state, the LFTs are normal.

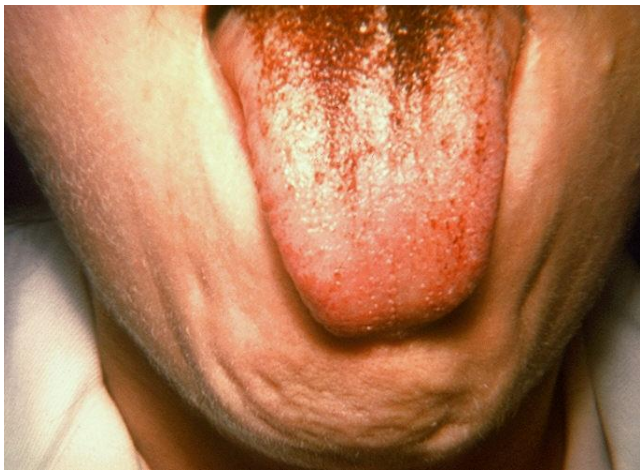
Topic: Dermatology



Antibody	*Description*
IgE	Antibody associated with type I hypersensitivity reaction
IgM	Core antibody elevated in acute hepatitis B infection
IgG	Core antibody elevated in chronic hepatitis B infection
IgA	Antibody most often deficient with recurrent infections

Question #42

Topic: Dermatology



Source: CDC/Emory Univ.; Dr. Sellers

Which of the following conditions applies to the above image?

A. Oral hairy leukoplakia

B. Lichen planus

C. Geographic tongue

D. Black hairy tongue

E. Candida of tongue

Answer #42

Topic: Dermatology
Correct Answer: Choice D (Black Hairy Tongue)

This picture shows Choice D (Black hairy tongue). Black hairy tongue features elongated filiform papillae on the dorsum of the tongue that are typically due to poor oral hygiene, antibiotic use or Candida infection.

Let's review the other choices:

- **Choice A** (Oral hairy leukoplakia) is a white patch on the lateral aspect of the tongue with a hairy appearance. It is usually caused by Epstein–Barr virus (EBV). Unlike other forms of leukoplakia, these lesions can't be scraped off the tongue.

- **Choice B** (Lichen planus) usually presents as painful lesions on mucosal areas that are purplish papules with white streaks on the surface. These are known as "Wickham striae". Sometimes lichen planus is associated with hepatitis C.

- **Choice C** (Geographic tongue) is a harmless condition where the surface of the tongue is covered with patches of tiny, pinkish-whitish bumps. This condition is also known as benign migratory glossitis.

- **Choice E** (Candida of tongue) is known as oral thrush and presents as a white coating of the tongue that can cause odynophagia or dysphagia symptoms. It is caused by several conditions including HIV, diabetes mellitus, antibiotics, or poor oral hygiene. The lesions are difficult to scrape off.

Topic: Dermatology

Black Hairy Tongue

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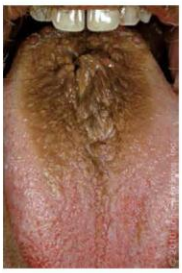
Cause

Poor oral hygiene
Antibiotic use
Candida infection



Pathology

Elongated filiform papillae on dorsum of tongue

Diagnosis	*Description*	*Cause*	*Other*
Oral hairy leukoplakia	White patch on lateral aspect of tongue with hairy appearance	EBV	Can't be scraped off
Lichen planus	Painful, purplish papules on mucosa with white streaks on surface	May be associated with Hepatitis C	
Candida of tongue ("oral thrush)	White coating of tongue with odynophagia or dysphagia symptoms	HIV Diabetes Antibiotics Poor oral hygiene	Difficult to scrape off

Question #43

Topic: Dermatology

Which of the following scenarios could cause gingival hyperplasia?

A. Diabetic with hypertension being treated with a medication which may cause dry cough
B. Patient being treated for either Raynaud's phenomenon or pulmonary hypertension with nifedipine
C. Patient being treated for atrial fibrillation with metoprolol
D. Patient taking excessive vitamin C supplements
E. Patient being treated with warfarin for deep venous thrombosis

Answer #43

Topic: Dermatology

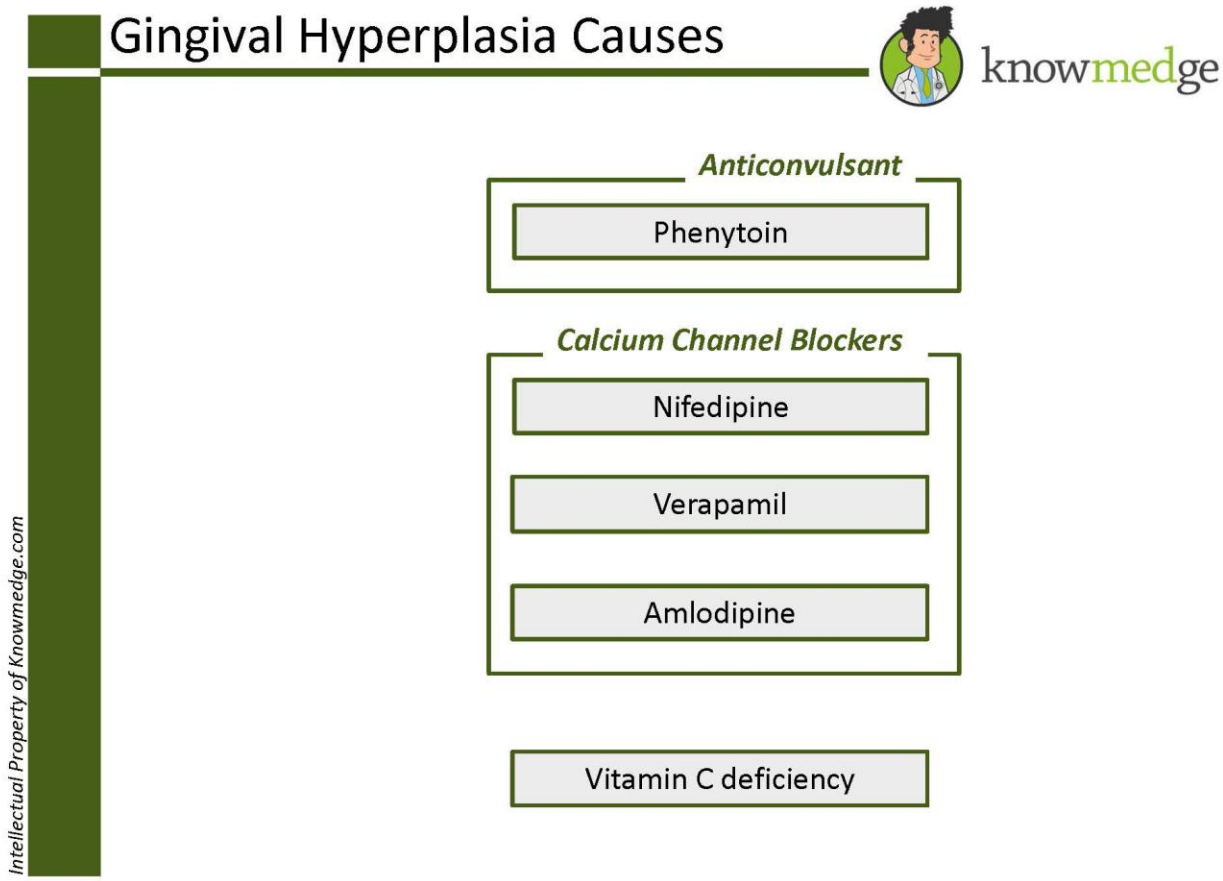
Correct Answer: Choice B (Patient being treated for either Raynaud's phenomenon or pulmonary hypertension with nifedipine)

Gingival hyperplasia (also known as gum hypertrophy) can develop because of certain medications. Most anticonvulsants can cause gingival hyperplasia but the most common one implicated is phenytoin. Another class of medication known to cause gingival hyperplasia are calcium channel blockers like nifedipine, verapamil, or amlodipine. From the above answer choices, only Choice B (Raynaud's phenomenon or pulmonary hypertension being treated with nifedipine) is the correct answer.

Let's go over the other answer choices:

- **Choice A** (Diabetic with hypertension being treated with a medication which may cause dry cough) is referring to ACE inhibitor.
- **Choice C** (Metoprolol) is not known to cause gum hyperplasia.
- **Choice D** (Excessive vitamin C) is not known to cause gum hyperplasia. The opposite, however, vitamin C deficiency, can cause gum hyperplasia.
- **Choice E** (Warfarin) is not known to cause for gum hyperplasia. The two main ones to remember are phenytoin and calcium channel blockers.

Topic: Dermatology



Chapter
11

Pulmonary Disease & Critical Care

Question #44

Topic: Pulmonary Disease & Critical Care

Subtopic: Obstructive Airway Disease

In which of the following scenarios would you use a low- to medium-dose inhaled steroid and a long-acting beta 2 agonist to treat a patient's asthma?

A. A patient having symptoms daily in the daytime, greater than five episodes per month at night and FEV1 of 65%

B. A patient having continuous symptoms daily, frequently at night and FEV1 of 55%

C. A patient having an acute asthma exacerbation

D. A patient with symptoms in the day greater than two times per week and at night greater than two times per month with FEV1 of 80%

E. A patient with daytime symptoms less than two times per week and at night less than two times per month with FEV1 of 80%

Answer #44

Topic: Pulmonary Disease & Critical Care

Subtopic: Obstructive Airway Disease

Correct Answer: Choice A (A patient having symptoms daily in the daytime, greater than five episodes per month at night and FEV1 of 65%)

Asthma is broken down into intermittent, mild persistent, moderate persistent and severe persistent. In order to distinguish these four categories, we analyze the degree of daytime symptoms, nighttime symptoms, and FEV1 measurement on pulmonary function tests.

- **Intermittent asthma** is defined as having either daytime symptoms less than 2 times/week or nighttime symptoms less than 2 times/month. The FEV1 here tends to be greater than 80%.
- **Mild persistent asthma** is defined as having either daytime symptoms greater than 2 times/week, but not daily, or greater than 2 nighttime awakening episodes per month. The FEV1 here also tends to be greater than 80%.
- **Moderate persistent asthma** is defined as having either daily daytime symptoms or nighttime symptoms greater than five episodes per month. The FEV1 here tends to be between 60-80%.
- **Severe persistent asthma** is defined as having either continuous daytime symptoms or frequent nighttime symptoms. The FEV1 here tends to be less than 60%.

Treatment options for asthma are dependent on the stage of asthma the patient is in:

- **Intermittent:** Requires short-acting β2 agonists as needed, which is a part of the treatment for all levels of asthma.
- **Mild persistent:** Requires low-dose inhaled corticosteroids or leukotriene inhibitors or theophylline.
- **Moderate persistent:** Requires low- to medium-dose inhaled corticosteroids and long-acting β2 agonists.

- **Severe persistent:** Requires high-dose inhaled steroids, long-acting β2 agonists and tapering of oral steroids.

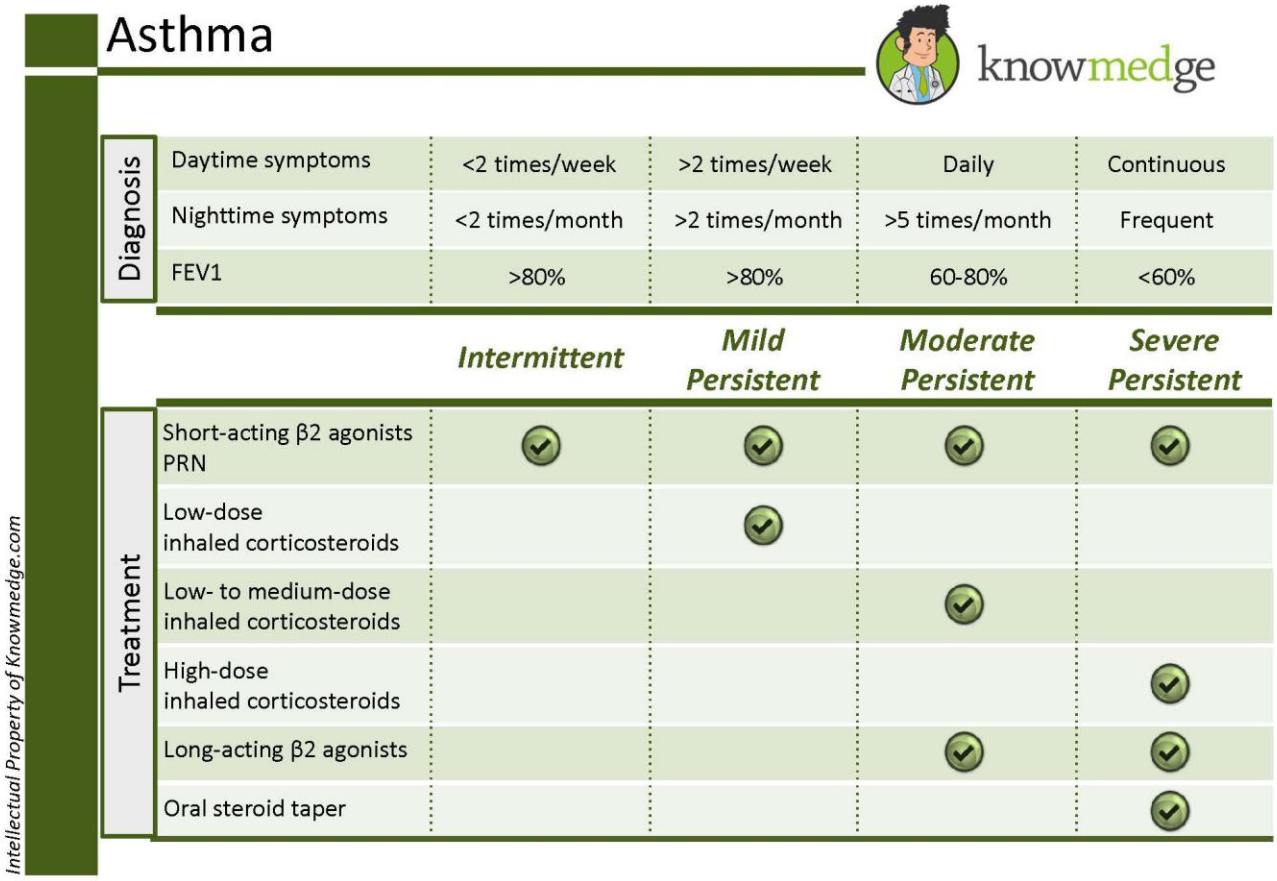
Now that we know these, we have to identify which answer choice refers to moderate persistent asthma (FEV1 of 60%-80%). Only the patient in **Choice A** (Patient having symptoms daily in the daytime, greater than five episodes per month at night and FEV1 of 65%) would fall under this categorization.

Going through the other answer choices:

- **Choice B** describes a patient with severe persistent asthma who usually has FEV1 less than 60%
- **Choice D** describes a patient with mild persistent asthma
- **Choice E** describes a patient with intermittent asthma

Topic: Pulmonary Disease & Critical Care

Subtopic: Obstructive Airway Disease



Question #45

Topic: Pulmonary Disease & Critical Care

Subtopic: Obstructive Airway Disease

62-year-old male with a 40 packs per year smoking history presents with shortness of breath and increased productive cough. He quit smoking two months ago. Pulmonary function testing reveals an FEV1/FVC of 68% with an FEV1 of 65%. He is currently on albuterol as needed. Which of the following would be the best addition to his current regimen?

A. Inhaled corticosteroids

B. Monteleukast

C. Theophylline

D. Long acting beta agonists

E. Refer him for lung reduction surgery

Answer #45

Topic: Pulmonary Disease & Critical Care

Subtopic: Obstructive Airway Disease

Correct Answer: Choice D (Long acting beta agonists)

Per the GOLD (Global Initiative for Chronic Obstructive Lung Disease) criteria, this patient likely has COPD. The spirometric criterion for a diagnosis of COPD is an FEV1/FVC ratio less than 70% after bronchodilator.

The FEV1 value is used to determine the severity of COPD. The severity will also help us determine the proper treatment as well:

- **Stage I (Mild)**
    - $FEV_1/FVC < 70\%$
    - $FEV_1 > 80\%$ of predicted value
    - Treatment: Short acting bronchodilator
- **Stage II (Moderate)**
    - $FEV_1/FVC < 70\%$
    - $50\% \leq FEV_1 < 80\%$ of predicted value
    - Treatment: Treatment for Mild COPD + regular treatment with long-acting bronchodilator + rehab
- **Stage III (Severe)**
    - $FEV_1/FVC < 70\%$
    - $30\% \leq FEV_1 < 50\%$ of predicted value
    - Treatment: Treatment for Moderate COPD + inhaled corticosteroids

- **Stage IV (Very severe)**
    - $FEV_1/FVC < 70\%$
    - $FEV_1 < 30\%$ of predicted value OR
    - $FEV_1 < 50\%$ of predicted value plus chronic respiratory failure
    - Treatment: Severe COPD + long-term oxygen and consider surgical options

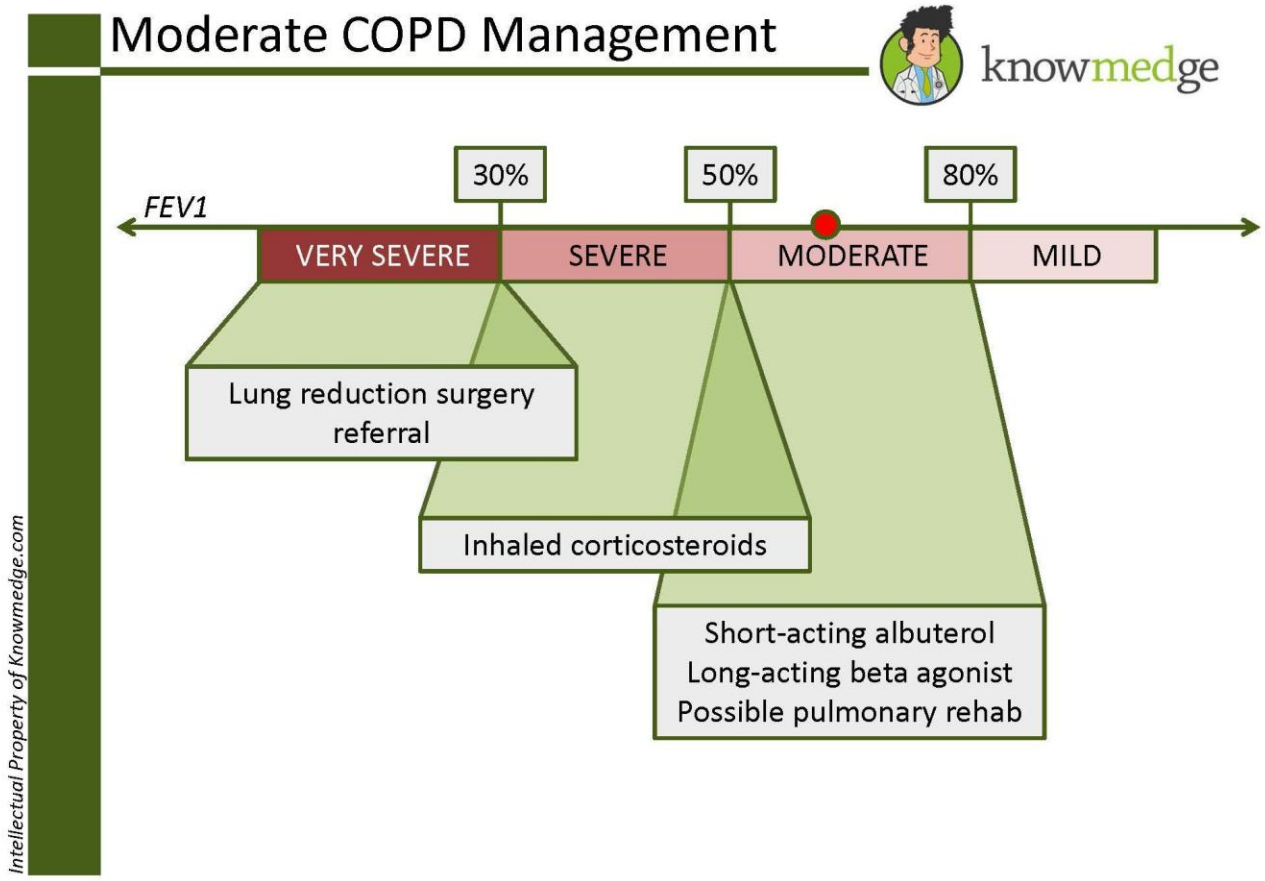
With an FEV_1 of 65%, the patient has moderate COPD (FEV_1 between 50% and 80%). The best treatment along with short-acting albuterol is **Choice D** (Long-acting beta agonist) with possible pulmonary rehab.

Let's go over the other answer choices:

- **Choice A** (Inhaled corticosteroids) is used for severe COPD, which is defined as a FEV_1 of less than 50%.
- **Choice B** (Montelukast) is used more for asthma rather than COPD.
- **Choice C** (Theophylline) is not used often for COPD anymore. It was a popular treatment option at one point but has lost favorability as more effective bronchodilators have come on to the market.
- **Choice E** (Referral for lung reduction surgery) can be considered for very severe COPD.

Topic: Pulmonary Disease & Critical Care

Subtopic: Obstructive Airway Disease



Question #46

Topic: Pulmonary Disease & Critical Care

Subtopic: Restrictive Lung Disease

You are given a set of pulmonary function test (PFT) readings that show:

- FEV_1 is low
- FEV_1/FVC ratio is elevated
- TLC is decreased
- DLCO is normal
- Residual volume is increased

Which of the following conditions does this patient likely have?

Answer #46

Topic: Pulmonary Disease & Critical Care

Subtopic: Restrictive Lung Disease

Correct Answer: Choice A (A patient having symptoms daily in the daytime, greater than five episodes per month at night and FEV1 of 65%)

PFTs can be interpreted into obstructive and restrictive lung diseases.

- Obstructive lung disease (characterized by airway obstruction) could be conditions such as COPD and asthma.

- Restrictive lung disease (characterized by reduced lung volume) can be further broken down into intrathoracic and extrathroacic diseases.

The first way to differentiate between obstructive and restrictive disease is to look at the TLC (Total Lung Capacity). With obstructive diseases, TLC would be increased. The way to understand this concept is the following:

- With obstructive diseases, there is bronchoconstriction or air trapping that occurs. As a result there is so much air in the lungs that total lung capacity and residual volume are increased.

- Restrictive diseases are just like the name sounds….they "restrict" the amount of air in the lungs which means TLC would be decreased.

This example shows that the TLC is decreased so we can eliminate **Choice A** (COPD) and **Choice B** (Asthma) since both are obstructive diseases. Now we have to choose between the other 3 choices. This is where we see if the condition is an extrathoraic or intrathoracic restrictive disease.

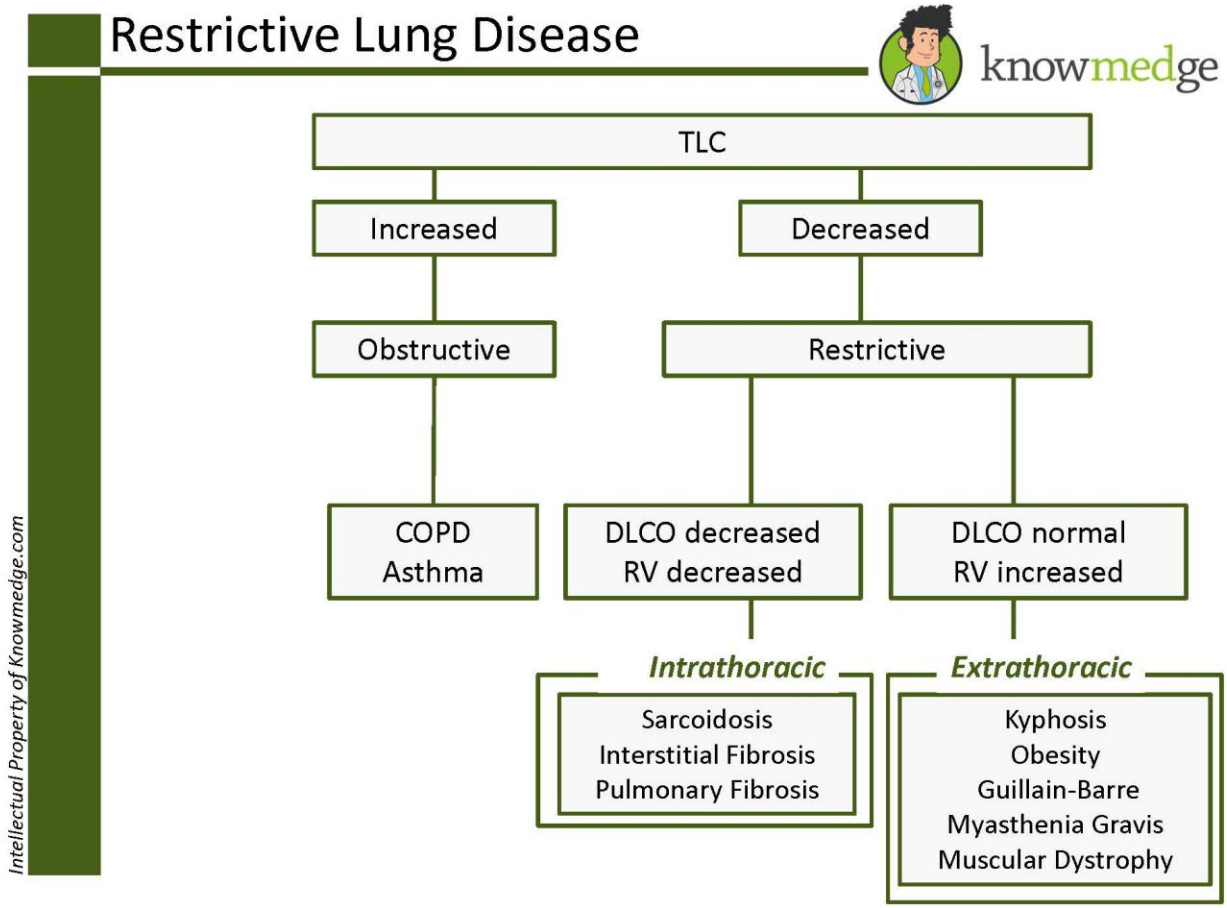
- Intrathoracic restrictive diseases consist of sarcoidosis, interstitial fibrosis, or pulmonary fibrosis. With these diseases, the DLCO and residual volume levels are decreased.

- Extrathoracic restrictive diseases consists of disorders such as: kyphosis, obesity, Guillain-Barre syndrome, Myasthenia Gravis, and muscular dystrophy. This would show a normal DLCO and increased residual volume levels.

Of the above, only **Choice D** (Obesity) could match the criteria for this patient.

Topic: Pulmonary Disease & Critical Care

Subtopic: Restrictive Lung Disease



Question #47

Topic: Pulmonary Disease & Critical Care

Subtopic: Pleural Disease

68-year-old male is admitted to the hospital for pneumonia. He had a chest xray done that reveals a left lung infiltrate and pleural effusion. He undergoes a thoracentesis that reveals an exudative effusion. After being in the hospital for a few days, he is not feeling better despite being on azithromycin and ceftriaxone. A CT scan of the chest is done which reveals a larger effusion on the left side so the decision is made to place a chest tube in the patient. A few days later, the patient states that his breathing has improved only slightly. However, he is spiking temperatures as high as 103°F. Which of the following is the next best step in management at this time?

A. Change antibiotics as these are not aggressive enough
B. Repeat thoracentesis
C. Change antibiotics and continue with chest tube drainage
D. Perform video assisted thoracic surgery (VATS)
E. No change required at this time

Answer #47

Topic: Pulmonary Disease & Critical Care

Subtopic: Pleural Disease

Correct Answer: Choice D (Perform video assisted thoracic surgery (VATS))

There are three types of parapneumonic pleural effusions:

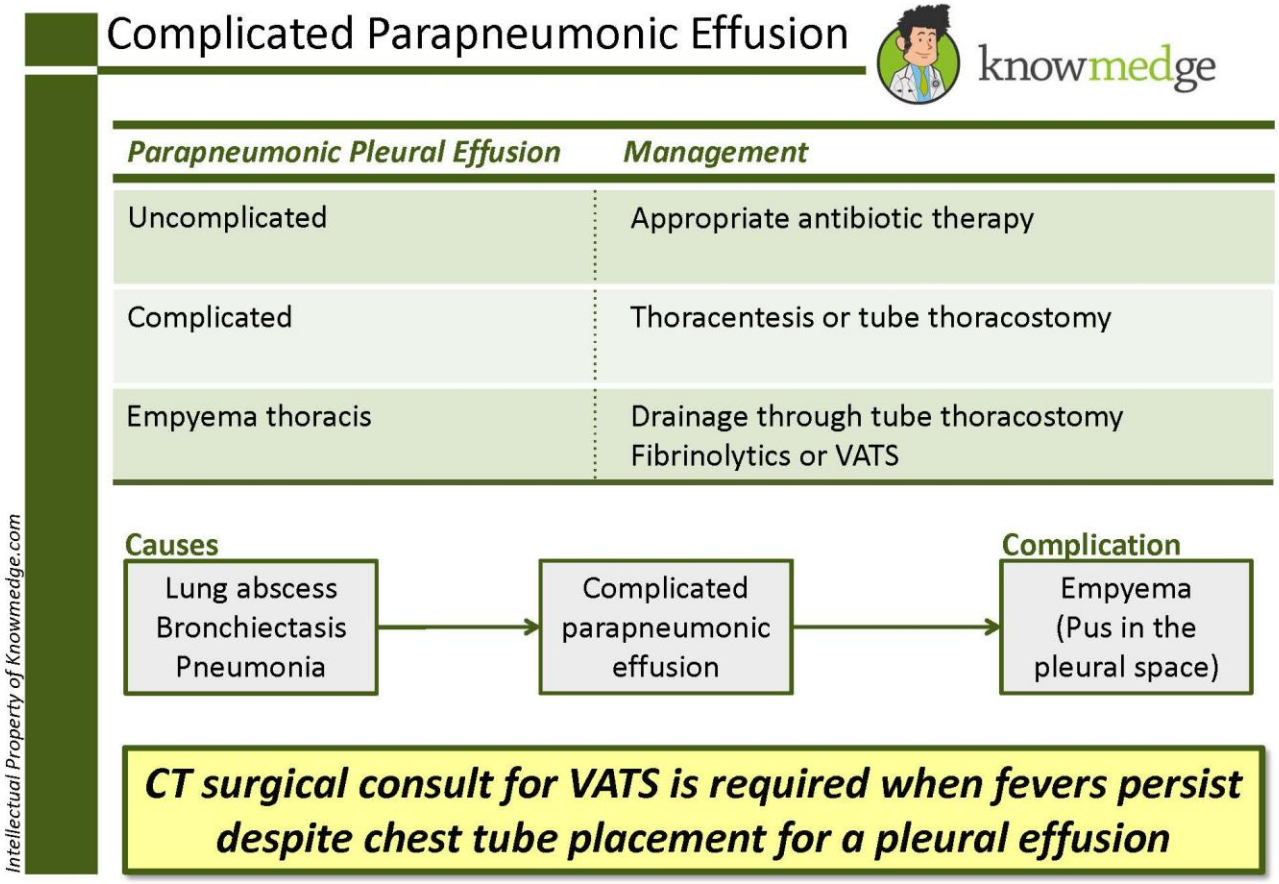
- **Uncomplicated parapneumonic effusions:** Generally resolve with appropriate antibiotic therapy
- **Complicated parapneumonic effusions:** Often require drainage through thoracentesis or tube thoracostomy.
- **Empyema thoracis:** Also requires drainage through tube thoracostomy. In addition, they may also require treatment with fibrinolytics or video assisted thoracic surgery (VATS).

This patient has a complicated parapneumonic pleural effusion that can develop into an empyema (pus in the pleural space) if not treated properly. Parapneumonic pleural effusions generally arise as a result of a lung abscess, bronchiectasis, or pneumonia.

Patients with pneumonia and a larger than minimal size effusion should undergo a therapeutic thoracentesis. Initially, this patient had a thoracentesis performed that revealed an exudate and the decision was made to treat solely with antibiotics. After a few days, he still wasn't feeling better and, therefore, a chest tube was placed to drain the fluid. If the patient still continues to experience spiking temperatures and is not improving, then the next step in management is to perform **Choice D** (Video assisted thoracic surgery).

Topic: Pulmonary Disease & Critical Care

Subtopic: Pleural Disease



Chapter
12

Rheumatology / Orthopedics

Question #48

Topic: Rheumatology / Orthopedics

Subtopic: Systemic Lupus Erythematosus

42-year-old female has a history of systemic lupus erythematosus (SLE) and now feels like she is having a flare-up. Which of the following set of labs would confirm an SLE flare-up?

A. Increased complement level, increased anti-dsDNA level, increased ESR level

B. Decreased complement level, increased anti-dsDNA level, increased ESR level

C. Decreased complement level, decreased anti-dsDNA level, increased ESR level

D. Increased complement level, decreased anti-dsDNA level, increased ESR level

E. Decreased complement level, decreased anti-dsDNA level, decreased ESR level

Answer #48

Topic: Rheumatology / Orthopedics

Subtopic: Systemic Lupus Erythematosus

Correct Answer: Choice B (Decreased complement level, increased anti-dsDNA level, increased ESR level)

Laboratory studies can provide a clue to the diagnosis of systemic lupus erythematosus (SLE) flare-up. Let's go through the lab results you would expect to see:

- **Complement level:** You would expect to see low complement levels in a patient with a SLE flare-up. Low complement levels mean a high level of lupus activity.

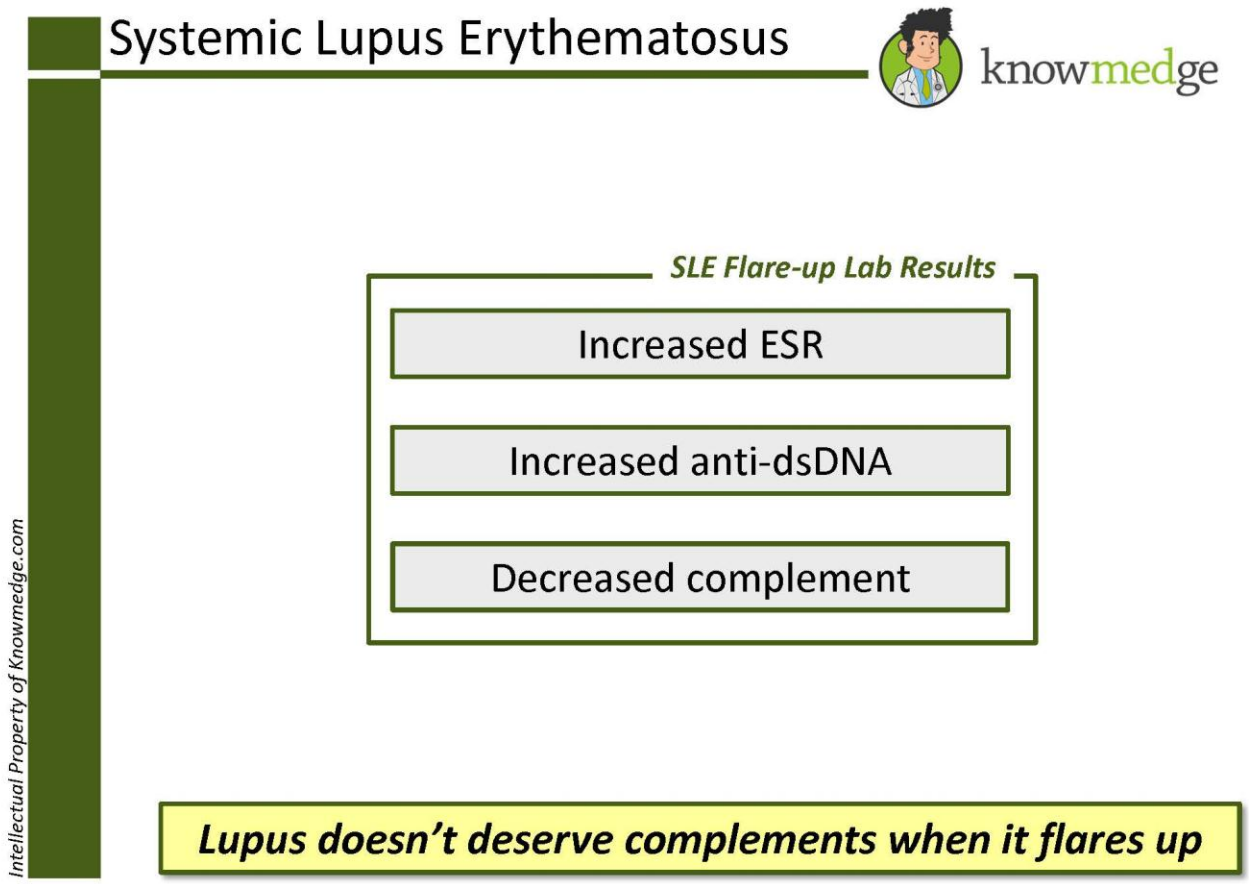
- **Anti-dsDNA:** Increased anti-dsDNA levels are typically seen before and during the period of SLE flare-up.

- **ESR:** This is a blood test that measures the amount of inflammation in the body - during a flare-up, you would expect to see the ESR level go up.

We would expect to see **Choice B** (Decreased complement level, increased anti-dsDNA level, and increased ESR level). A mnemonic to assist in remembering which of the tests in a SLE flare-up is decreased is to think that lupus does not deserve complements when it flares up.

Topic: Rheumatology / Orthopedics

Subtopic: Systemic Lupus Erythematosus



Question #49

Topic: Rheumatology / Orthopedics
Subtopic: Crystal-Induced Arthropathy

57-year-old female presents with sudden onset of right knee pain that started yesterday. She says that the right knee is red, swollen and tender to touch. She has never been put on any medication for this in the past because it doesn't occur often. She states that she is only sexually active with her husband. She denies any trauma to the right knee. Vital signs including temperature are stable. Physical exam is remarkable for tachycardia because of pain and right knee that is boggy, red, warm and tender to touch. Which of the following statements is true of gout?

A. The patient's gout will have positive birefringent crystals excected from knee arthrocentesis
B. The patient's gout will have rhomboid shaped crystals that would be expected from knee arthrocentesis
C. The patient's gout will have a WBC count of 500/μL from knee arthrocentesis
D. Due to the patient's gout, indomethacin and allopurinol should be started at this time
E. The patient's gout could have a WBC count of 6,000/μL from knee arthrocentesis

Answer #49

Topic: Rheumatology / Orthopedics

Subtopic: Crystal-Induced Arthropathy

Correct Answer: Choice B (Decreased complement level, increased anti-dsDNA level, increased ESR level)

When a patient presents with acute pain located in one joint, you should consider gout, pseudogout, septic arthritis, or trauma.

Arthrocentesis values to remember are the following:

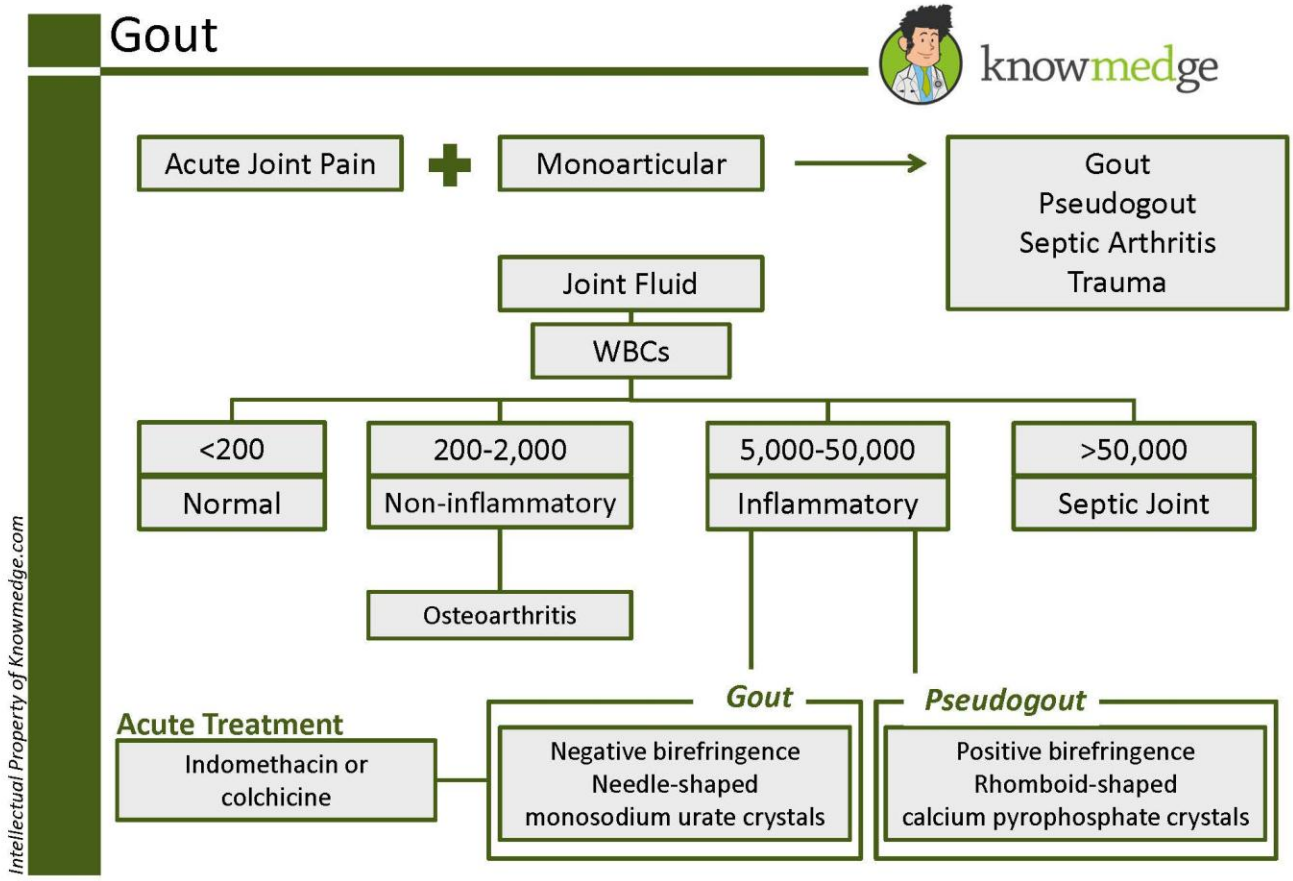
- **Less than 200/µL WBCs:** are normal
- **200/µl - 2,000/µL WBCs:** suggests a non-inflammatory process, such as osteoarthritis, degenerative joint disease
- **5,000/µL - 50,000/µL WBCs:** corresponds to an inflammatory process
- **Greater than 50,000/µL WBCs:** suggests a septic joint

Gout and pseudogout are both inflammatory monoarticular arthropathies. This means that arthrocentesis would yield between 5,000/µL - 50,000/µL WBCs so choice E (WBCs of 6,000/µL) is the correct answer.

Choice A (Positive birefringence) and **Choice B** (Rhomboid crystals) are seen with pseudogout, not gout. Gout would have needle shaped crystals and negative birefringence. Indomethacin or colchicine are recommended for acute attack. Allopurinol should never be started in an acute attack and never be discontinued if the patient is on it already. Since the patient is having an acute attack, we don't want to start allopurinol making **Choice D** (Start indomethacin and allopurinol) incorrect.

Topic: Rheumatology / Orthopedics

Subtopic: Crystal-Induced Arthropathy



Question #50

Topic: Rheumatology / Orthopedics
Subtopic: Localized Joint Syndromes

46-year-old female presents with pain in her shoulder, neck and lower back which she has been experiencing for about four months. She mentions waking up occasionally at night due to the pain. She also mentions experiencing fatigue and headaches. Upon physical exam, she has tenderness at several points all over her body. She denies any joint swelling, redness, warmth, rash, chest pain, dyspnea, numbness/tingling, or muscle weakness. Thyroid function tests and erythrocyte sedimentation rate (ESR) blood tests are checked and are normal. Based on what this patient likely has, which of the following is the next best step in management at this time?

A. Start the patient on low dose prednisone
B. Start the patient on a low impact aerobic exercise program
C. Start NSAIDs
D. Obtain ANA blood levels
E. Perform a diagnostic electromyogram (EMG) test

Answer #50

Topic: Rheumatology / Orthopedics

Subtopic: Localized Joint Syndromes

Correct Answer: Choice B (Start the patient on a low impact aerobic exercise program)

From patient's clinical presentation, she is likely suffering from fibromyalgia. This is a condition that affects females more often than males and is common between the ages of 40-60. The pain occurs at several points above and below the waist, and symptoms have to be present for at least three months. Patients will also often experience anxiety and depression. The clue for fibromyalgia on her physical exam is point tenderness at several points all over the body. The patient will also likely have fatigue and difficulty sleeping and a normal ESR level (inflammatory marker). The best initial conservative measure for fibromyalgia is **Choice B** (Low impact aerobic exercise program), with a goal to progress to moderate intensity aerobic exercise program.

Let's go over the other answer choices:

- **Choice A** (Low dose prednisone) is not used to treat fibromyalgia. It is a treatment option for polymyalgia rheumatica. This is a condition that causes pain and stiffness in the neck and shoulder areas and almost exclusively occurs after age 50. It is also associated with an elevated ESR. About 30 percent of the time, polymyalgia rheumatica is associated with temporal arteritis.

- **Choice C** (NSAIDs) is not a good treatment option alone for fibromyalgia but can be used with amitriptyline to help control the pain.

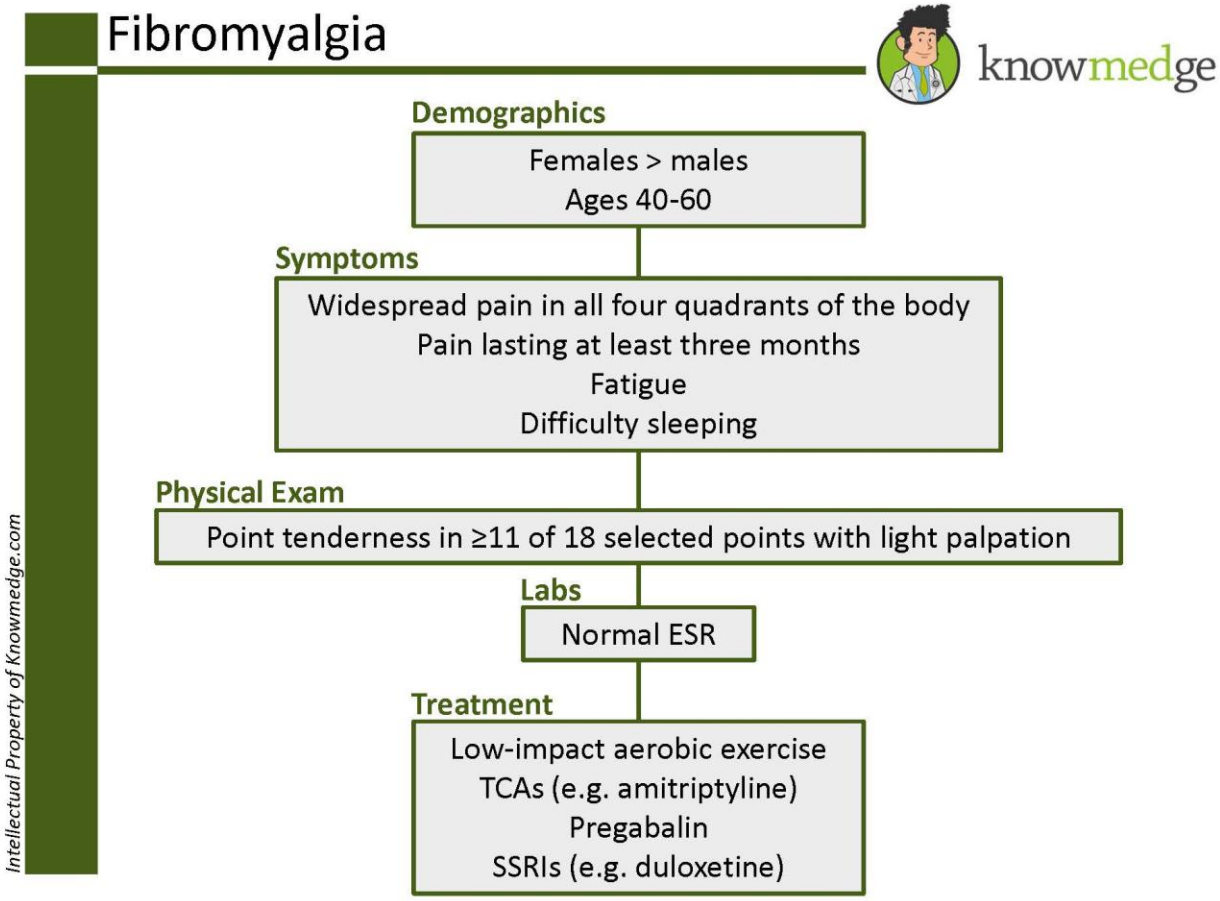
- **Choice D** (ANA blood levels) is not necessary since the patient does not have systemic symptoms or features of Systemic lupus erythematosus (SLE). ANA blood levels is a screening test for SLE.

- **Choice E** (Diagnostic EMG test) is not necessary either since the patient does not have complaints of numbness/tingling that would indicate nerve conduction problems.

The medications typically used for the treatment of fibromyalgia include tricyclic antidepressants (e.g. amitriptyline), anti-depressants, anti-seizure drugs, pregabalin and selective serotonin reuptake inhibitors (e.g. duloxetine) but should not replace an aerobic exercise program. Aerobic exercise is not only good for the fibromyalgia but is also beneficial for physical and mental wellness.

Topic: Rheumatology / Orthopedics

Subtopic: Localized Joint Syndromes



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